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WL-TM-92-338-FIGC

X-29 LINEAR AERODYNAMIC
PERTURBATION MODEL



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FLIGHT DYNAMICS DIRECTORATE
WRIGHT LABORATORY
AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AFB, OHIO 45433-6553

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Foreword

This work was performed by Thomas A. Gentry of the Control Dynamics Branch,
Flight Control Division, under job order number 24030595.



FRANK R. SWORTZEL, CHIEF
Control Dynamics Branch
Flight Control Division

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INTRODUCTION

This memo documents the linear aerodynamic and thrust perturbation model of the X-29 simulation model resident in the Control Integration and Assessment Branch of Wright Laboratory (WL/FIGD) at Wright-Patterson Air Force Base, Ohio. This model was used to perform flying qualities evaluations of the X-29 aircraft at Wright Laboratory during the airplane's development in the early to mid-1980s.

This work was conducted in order to document the X-29 longitudinal and lateral-directional linear aero model at numerous trim flight conditions for use in future research work in flying qualities. The X-29 is representative of typical fighter aircraft, even with its forward-swept wing, although the airframe is very unstable longitudinally.

This memo is divided into four sections: Introduction, Definition of Terms, Explanation of Computer Printouts, and Computer Printouts sections. Definitions of all terms associated with the linear model are given in the Definition of Terms section. Explanation of all of the data in the computer printouts is given in the Explanation of Computer Printouts section. The Computer Printouts section contains the actual computer printouts for each trim flight condition.

Mr Dan Goddard of WL/FIGD wrote much of the original computer software that generated the linear model given in this memo. The software was modified where necessary to make the computer printout easier to understand and to complete the lateral-directional section of the software. Mr Brian Stadler and Mr Joe Nalepka of WL/FIGD resurrected and documented the X-29 aero model for this project and helped immensely in explaining the computer system and software at WL/FIGD.

DEFINITION OF TERMS

The aerodynamic forces and moments for the model are defined in terms of nondimensional aero coefficients, C_x , C_y , C_z , and C_l , C_m , C_n , respectively. The x axis is positive out the front of the airplane, the y axis is positive out the right wing, and the z axis is positive out the bottom of the airplane. The aerodynamic forces and moments are functions of twelve variables, seven in the longitudinal axis and five in the lateral-directional axis. These twelve variables are: angle of attack, pitch rate, Mach number, angle of attack rate, strake deflection, canard deflection, flaperon deflection, angle of sideslip, roll rate, yaw rate, aileron deflection, and rudder deflection. Thrust variation is also included in the linear model and is a function of two variables, Mach number and altitude. Thrust is aligned along the aircraft centerline parallel to the x axis (no inclination angle) above the center of gravity (negative pitching moment).

The linear model is produced by perturbing each of the twelve variables, one at a time, in a positive direction and then in an equal negative direction from the trim value. The partial derivatives required for the nondimensional and dimensional derivatives are calculated by dividing the total variation in each nondimensional aero coefficient or thrust by the total variation in each of the twelve independent variables. Altitude is not

varied in these linear models. All angular and angular rate independent variables are varied plus and minus one degree or one degree/second, respectively. Mach number is varied plus and minus 0.05.

All aero coefficients and nondimensional and dimensional derivatives follow the definitions given in Appendix A of NASA CR-2144 (Reference 1) except for two variations. It was decided to make all sign conventions agree for forces and moments. This is so all nondimensional coefficients and nondimensional and dimensional derivatives are positive in the positive directions of the axis system. Therefore, C_x is the opposite sign of the C_x in NASA CR-2144 and C_z is the negative of the C_N in NASA CR-2144. The lateral-directional L and N dimensional derivatives are converted to primed derivatives as defined in NASA CR-2144 for print out. Please note that all coefficients and derivatives are in a body axis system, not a stability axis system.

The dimensional derivatives are used to generate a longitudinal and lateral-directional state space model according to the following equations. The general form of the state space model is:

$$\dot{x} = Ax + Bu$$

where A is a 4×4 matrix and B is a 4×3 matrix for the longitudinal model or a 4×2 matrix for the lateral-directional model.

Longitudinal State Space Model

The state vector x contains forward speed, angle of attack, pitch rate and pitch angle. The input vector u contains strake, flaperon and canard deflections. The elements of the A matrix are:

$$A(1,1) = X_u^* + \frac{X_{\dot{\alpha}} Z_u^*}{U_0 - Z_{\dot{\alpha}}}$$

$$A(1,2) = X_{\dot{\alpha}} + \frac{X_{\dot{\alpha}} Z_{\alpha}}{U_0 - Z_{\dot{\alpha}}}$$

$$A(1,3) = X_q - W_0 + \frac{X_{\dot{\alpha}} (U_0 + Z_{\dot{\alpha}})}{U_0 - Z_{\dot{\alpha}}}$$

$$A(1,4) = -g \cos \theta_0 + \frac{X_{\dot{\alpha}} (-g \sin \theta_0)}{U_0 - Z_{\dot{\alpha}}}$$

$$A(2,1) = \frac{Z_u^*}{U_0 - Z_{\dot{\alpha}}}$$

$$A(2,2) = \frac{Z_{\alpha}}{U_0 - Z_{\dot{\alpha}}}$$

$$A(2,3) = \frac{U_0 + Z_q}{U_0 - Z_{\dot{\alpha}}}$$

$$A(2,4) = \frac{-g \sin \theta_0}{U_0 - Z_{\dot{\alpha}}}$$

$$A(3,1) = M_u^* + \frac{M_{\dot{\alpha}} Z_u^*}{U_0 - Z_{\dot{\alpha}}}$$

$$A(3,2) = M_{\alpha} + \frac{M_{\dot{\alpha}} Z_{\alpha}}{U_0 - Z_{\dot{\alpha}}}$$

$$A(3,3) = M_q + \frac{M_{\dot{\alpha}} (U_0 + Z_q)}{U_0 - Z_{\dot{\alpha}}}$$

$$A(3,4) = \frac{-M_{\dot{\alpha}} g \sin \theta_0}{U_0 - Z_{\dot{\alpha}}}$$

$$A(4,1) = 0$$

$$A(4,2) = 0$$

$$A(4,3) = 1$$

$$A(4,4) = 0$$

The elements of the B matrix are:

$$B(1,1) = X_{\delta_s} + \frac{X_{\dot{\alpha}} Z_{\delta_s}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(2,1) = \frac{Z_{\delta_s}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(3,1) = M_{\delta_s} + \frac{M_{\dot{\alpha}} Z_{\delta_s}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(4,1) = 0$$

$$B(1,2) = X_{\delta_t} + \frac{X_{\dot{\alpha}} Z_{\delta_t}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(2,2) = \frac{Z_{\delta_t}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(3,2) = M_{\delta_t} + \frac{M_{\dot{\alpha}} Z_{\delta_t}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(4,2) = 0$$

$$B(1,3) = X_{\dot{\alpha}} + \frac{X_{\dot{\alpha}} Z_{\delta_c}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(2,3) = \frac{Z_{\delta_c}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(3,3) = M_{\dot{\alpha}} + \frac{M_{\dot{\alpha}} Z_{\delta_c}}{U_0 - Z_{\dot{\alpha}}}$$

$$B(4,3) = 0$$

Terms with subscripts of δ_s , δ_f , or δ_c are associated with the strake, flaperon, or canard control surfaces, respectively.

Lateral-Directional State Space Model

The state vector x contains angle of sideslip, roll rate, yaw rate, and bank angle. The input vector u contains aileron and rudder deflections. The elements of the A matrix are:

$$A(1,1) = \frac{Y_\beta}{V_{T_0}}$$

$$A(1,2) = \frac{Y_p + W_0}{V_{T_0}}$$

$$A(1,3) = \frac{Y_r - U_0}{V_{T_0}}$$

$$A(1,4) = \frac{g \cos \theta_0}{V_{T_0}}$$

$$A(2,1) = L'_\beta$$

$$A(2,2) = L'_p$$

$$A(2,3) = L'_r$$

$$A(2,4) = 0$$

$$A(3,1) = N'_\beta$$

$$A(3,2) = N'_p$$

$$A(3,3)=N_r'$$

$$A(3,4)=0$$

$$A(4,1)=0$$

$$A(4,2)=1$$

$$A(4,3)=\frac{\sin \theta_0}{\cos \theta_0}$$

$$A(4,4)=0$$

The elements of the B matrix are:

$$B(1,1)=\frac{Y_{\delta_a}}{V_{T_0}}$$

$$B(1,2)=\frac{Y_{\delta_r}}{V_{T_0}}$$

$$B(2,1)=L_{\delta_a}'$$

$$B(2,2)=L_{\delta_r}'$$

$$B(3,1)=N_{\delta_a}'$$

$$B(3,2)=N_{\delta_r}'$$

$$B(4,1)=0$$

$$B(4,2)=0$$

Terms with subscripts of δ_a or δ_r , are associated with the aileron or rudder control surfaces, respectively.

EXPLANATION OF COMPUTER PRINTOUTS

The computer printout is divided into six pages for each trim condition. The first page is a printout of the trim condition including the aircraft state, positions of the controls, the trim aerodynamics, and aircraft constants. The second page is a printout of all of the nondimensional aero derivatives and thrust-related derivatives. The third page is a printout of the longitudinal dimensional stability derivatives, the longitudinal state space

model, the roots of the longitudinal characteristic dynamic equation, and the period, damping ratio, damped and undamped natural frequencies for each complex pair of roots present in the characteristic equation. The fourth page is a printout of all longitudinal transfer functions for each state output to each control surface input and the transfer function for normal acceleration output at the center of gravity to each control surface input. The fifth page is a printout of the lateral-directional dimensional derivatives, the lateral-directional state space model, the roots of the lateral-directional characteristic dynamic equation, and the period, damping ratio, damped and undamped natural frequencies for each complex pair of roots present in the characteristic equation. The sixth page is a printout of all lateral-directional transfer functions for each state output to each control surface input and the transfer function for side acceleration output at the center of gravity to each control surface input.

The first page summary of the trim condition is fairly self-explanatory. All trim conditions are for straight, wings-level, 1g flight. All angular values are in degrees. The variable "VTRFPS" is the aircraft trim airspeed in feet per second. The fuselage station and waterline position of the center of gravity are given as the variables "XCG" and "ZCG", respectively, and are in inches. The flight control system MODE status logicals at the bottom of the AIRCRAFT STATE section are a carryover from the original linearization software code and have no effect on the linear model given in the printout. The model is strictly for the airframe aerodynamics and thrust variation with Mach. Based on the signs of the nondimensional and dimensional derivatives, the three longitudinal controls, canards, flaps, and strakes are positive trailing edge down. The rudder is positive trailing edge left and the ailerons are positive right wing surface trailing edge up. The thrust at trim is shown in pounds. Also, although not printed out, the thrust line is above the center of gravity by a distance of 75.204 inches minus the value of "ZCG" (negative pitching moment). The variable "% RPM" is the percent of full throttle required to set the thrust at the trim value. The nondimensional aero coefficients at trim are given in the DYNAMICS section and are positive in the positive directions of the axis system as explained earlier.

The second page of the printout is a listing of all of the nondimensional aero derivatives and thrust variation with Mach perturbation. The calculation of the nondimensional derivatives and thrust variation is consistent with Appendix A of NASA CR-2144.

The third page of the printout lists the longitudinal dimensional stability derivatives, with units shown. The thrust variation with Mach perturbation has been included in the calculation of these dimensional derivatives. The longitudinal state space model A and B matrices are then printed out. All angular states, "ALPHA", "Q", and "THETA", and the control surface inputs, "STRAKE", "FLAPRN", and "CANARD" in this model have units of radians or radians/second, as appropriate, and the speed state, "VEL", has units of feet/second. The system roots of the A matrix are then printed out in real/imaginary form. Finally, the period, damping ratio, and damped and undamped natural frequencies for any complex pair of system roots is printed out.

The fourth page of the printout lists the transfer functions in Laplace form for the

output of each state to each control surface input. The units on the transfer functions are the same as the units on the states and surface deflections in the state space model. Also, the transfer function of the acceleration at the center of gravity in the z direction to each control surface input is also listed as "AN/STRK", "AN/FLAP", AND "AN/CAN". These transfer functions are based on the states according to the following equation:

$$AN = U_0 \dot{\alpha} - U_0 q + (g \sin \theta_0) \theta$$

The units on this acceleration are feet/second² and it is positive in the positive z direction.

The fifth and sixth pages repeat the same type of information for the lateral-directional motion as the third and fourth pages did for the longitudinal motion. The lateral-directional dimensional derivatives have units as shown. The lateral-directional state space model states and surface deflections all have units of radians or radians/second, as appropriate. The transfer functions include the acceleration at the center of gravity in the y direction for aileron and rudder deflections, "AY/AIL" and "AY/RUD", respectively. The transfer functions are based on the states according to the following equation:

$$AY = U_0 \dot{\beta} - (g \cos \theta_0) \phi + U_0 r - W_0 p$$

The units on this acceleration are feet/second² and it is positive in the positive y direction.

Computer Printout Variables By Page

Page 1

The variables printed out on page 1 are as follows:

ACGW	Aircraft gross weight, pounds
AREA	Reference wing area, feet ²
AILERON	Trim aileron deflection, positive right wing surface trailing edge up, degrees
ALPHA	Trim angle of attack, positive nose up, degrees
ALT	Altitude above sea level, positive up, feet

AR MODE	Flight control system mode, not used
BETA	Trim angle of sideslip, positive nose right, degrees
CANARDS	Trim canard deflection, positive trailing edge down, degrees
CBAR	Reference chord, feet
CLMAERO	Trim nondimensional x-axis aero moment coefficient, positive right wing down
CMMAERO	Trim nondimensional y-axis aero moment coefficient, positive nose up
CNMAERO	Trim nondimensional z-axis aero moment coefficient, positive nose right
CXAERO	Trim nondimensional x-axis aero force coefficient, positive forward
CYAERO	Trim nondimensional y-axis aero force coefficient, positive out the right wing
CZAERO	Trim nondimensional z-axis aero force coefficient, positive out the bottom of the airplane
DR MODE	Flight control system mode, not used
DYN PR	Trim dynamic pressure, pounds/feet ²
FLAPS	Trim flaperon deflection, positive trailing edge down, degrees
GAMMA	Trim flight path angle, positive up, degrees
GEAR DOWN	Landing gear up if F(also), down if T(rue), always F
IXX	Aircraft x-axis moment of inertia, slug-feet ²
IXZ	Aircraft product of inertia, slug-feet ²
IYY	Aircraft y-axis moment of inertia, slug-feet ²
IZZ	Aircraft z-axis moment of inertia, slug-feet ²
MACH	Mach number, dimensionless
NORMAL MODE	Flight control system mode, not used

NX	Trim forward acceleration in g's, positive forward, dimensionless, always zero
NY	Trim side acceleration in g's, positive to the right, dimensionless, always zero
NZ	Trim normal acceleration in g's, positive out top of airplane, dimensionless
% RPM	Trim throttle setting, percent of full setting
RHO	Air density, slugs/feet ³
RUDDER	Trim rudder deflection, positive trailing edge left, degrees
SPAN	Reference wing span, feet
STRAKES	Trim strake deflection, positive trailing edge down, degrees
THETA	Trim pitch attitude, positive nose up, degrees
THRUST	Trim engine thrust, positive forward, pounds
VC KTS	Trim calibrated airspeed, knots
VTRFPS	True airspeed, positive forward, feet/second
XCG	Fuselage station position of the center of gravity, positive forward, inches
ZCG	Waterline position of the center of gravity, positive up, inches

Page 2

This page is fairly self-explanatory. All nondimensional stability derivatives are per radian for angular perturbations and per Mach number for the Mach derivatives. Thrust is separated from the aerodynamic derivatives as shown in the far right column. Thrust only varies with Mach number. Thrust variation with all other longitudinal perturbations is zero as shown. Thrust variation with Mach number has units of pounds per Mach number as shown.

Page 3

All dimensional stability derivatives have units as shown at the top of each column and at the left of each row. For example, the units for Z_α are feet/second² per radian. The "feet/second²" is shown at the top of the "Z" column just under the "Z" and the "per radian" is shown at the left next to the "ALPHA".

The state space model variables are as follows:

ALPHA	Angle of attack, positive nose up, radians
CANARD	Canard deflection, positive trailing edge down, radians
FLAPRN	Flap deflection, positive trailing edge down, radians
Q	Pitch rate, positive nose up, radians/second
STRAKE	Strake deflection, positive trailing edge down, radians
THETA	Pitch attitude, positive nose up, radians
VEL	X-axis velocity, positive forward, feet/second

The SYSTEM POLES are the roots of the characteristic equation of the A matrix in real, imaginary form.

The DYNAMICS variables for each pair of complex SYSTEM POLES are as follows:

PERIOD	Period for one cycle, seconds
WD	Damped natural frequency, radians/second
WN	Undamped natural frequency, radians/second
ZETA	Damping ratio, dimensionless

Page 4

This page lists all of the longitudinal transfer functions in polynomial form for each state output to each control surface deflection input. It also gives the transfer function for the z-axis acceleration at the center of gravity to each control surface input. The output and input variables are as follows:

ALP	Angle of attack, positive nose up, radians
AN	Z-axis acceleration at center of gravity, positive out bottom of airplane, feet/second ²
CAN	Canard deflection, positive trailing edge down, radians
FLAP	Flap deflection, positive trailing edge down, radians
Q	Pitch rate, positive nose up, radians/second

STRK	Strake deflection, positive trailing edge down, radians
THT	Pitch attitude, positive nose up, radians
U	X-axis velocity, positive forward, feet/second

Page 5

All dimensional stability derivatives have units as shown at the top of each column and at the left of each row the same as page 3.

The state space model variables are as follows:

AIL	Aileron deflection, positive right wing surface trailing edge up, radians
BETA	Angle of sideslip, positive nose right, radians
P	Roll rate, positive right wing down, radians/second
PHI	Bank angle, positive right wing down, radians
R	Yaw rate, positive nose right, radians/second
RUD	Rudder deflection, positive trailing edge left, radians

The SYSTEM POLES and DYNAMICS are listed the same as for page 3.

Page 6

This page lists all of the lateral-directional transfer functions in polynomial form for each state output to each control surface deflection input. It also gives the transfer function for the y-axis acceleration at the center of gravity to each control surface input. The variable names and units are the same as the state space model names and units on page 5. AY is the y-axis acceleration at the center of gravity. It is positive out the right side of the airplane and has units of feet/second².

References

1. Heffley, R. K. and W. F. Jewell, "Aircraft Handling Qualities Data", NASA CR-2144, December 1972.

COMPUTER PRINTOUTS

This section consists of the following Mach, altitude combinations:

Mach	Altitude (feet)	Page
.3	100	13
.5	100	19
.7	100	25
.9	100	31
.95	100	37
.5	10000	43
.7	10000	49
.9	10000	55
1.1	10000	61
.5	20000	67
.7	20000	73
.9	20000	79
1.1	20000	85
1.2	20000	91
.5	30000	97
.7	30000	103
.9	30000	109
1.1	30000	115
1.3	30000	121
.7	40000	127
.9	40000	133
1.1	40000	139
1.3	40000	145

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AIRCRAFT STATE

MACH =	.30000	ALT =	100.00	VTRFPS =	334.97
NZ =	.99509	ALPHA =	.42495	BETA =	.00000
GAMMA =	.00000	THETA =	.42498	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IY2 =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-3.87056	FLAPS =	9.54432	STRAKES=	-7.74468
AILERON=	.00000	RUDDER =	.00000		
THRUST =	1797.586	X RPM =	9.79640		

DYNAMICS

CAERO =	.00000000	CZAERO =	-.64324743
CLMAERO=	.00000000	CNMAERO=	.00000000
YC KTS =	198.088	DYN PR =	132.95734

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	.5321831	-4.7935514	1.7297268	-0000000
PITCH RATE(PER RAD)	.0000000	-6.5870295	-7.2356968	.0000000
STRAKE (PER RAD)	.0354164	-.2180922	-.3314270	.0000000
MACH (PER M #)	.0192620	-.0059533	.0156562	31.5185547
ALPHA DOT (PER RAD)	.0000000	-.4724714	-.9685700	.0000000
CANARD (PER RAD)	-.0462081	-.2957808	.7754377	.0000000
FLAPERON (PER RAD)	.0360977	-1.4238043	-.5511451	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.0915518	.2805405	-.0387872
ROLL RATE (PER RAD)	.0000000	-.0325567	-.3489300
YAW RATE (PER RAD)	.0000000	-.2125371	.1889825
AILERON (PER RAD)	-.2156202	.0809913	.2325273
RUDDER (PER RAD)	.2488604	-.1437383	.0413010

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LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	² FT/SEC**2	^M RAD/SEC**2	^X FT/SEC**2
ALPHA (PER RAD)	-242.3988647	6.1472998	26.1457520
ALPHADOT (PER R/S)	-.2499233	-.0370441	.0000000
Q (PER R/S)	-3.5285263	-.2802473	.0000000
VEL (PER FT/S)	-.1103693	-.0018412	-.0081129
STRAKE (PER RAD)	-10.8402023	-1.1910839	1.7603598
FLAPRN (PER RAD)	-70.7697144	-1.9807072	1.7942238
CANARD (PER RAD)	-14.7016869	2.7367708	-2.2967596

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-8113E-02	.2615E+02	-3748E+02	-3197E+02	.1760E+01	*1794E+01	-2297E+01
-3313E-03	-.7277E+00	.9887E+00	-.1081E-01	-.3254E-01	-2125E+00	-.4413E-01
-1829E-02	-.6174E+01	-.3169E+00	.4004E-03	-.1190E+01	-1973E+01	-2788E+01
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

1.9813757E+00	'+J (0.0000000E+00)
-3.0114660E+00	'+J (0.0000000E+00)
-1.1294723E-02	'+J (1.3401318E-01)
-1.1294723E-02	'+J (-1.3401318E-01)

DYNAMICS

PERIOD= 46.8848 WD= .13401
ZETA= .08398 WN= .13449

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D23 >AGE 4

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S⁴
 1.0526638E+00 S³
 -5.9254580E+00 S²
 -1.1623371E-01 S¹
 -1.0793537E-01 S⁰

NUMERATOR ALP/STRK
 -3.2542206E-02 S³
 -1.1875410E+00 S²
 -1.2668468E-02 S¹
 -1.0561358E-02 S⁰

NUMERATOR ALP/FLAP
 -2.1245015E-01 S³
 -2.0200968E+00 S²
 -8.3314553E-03 S¹
 -8.2647763E-03 S⁰

NUMERATOR U/STRK
 1.7603598E+00 S³
 4.55881926E+01 S²
 3.6661224E+01 S¹
 3.4560318E+01 S⁰

NUMERATOR U/FLAP
 1.7942238E+00 S³
 7.0267410E+01 S²
 1.02275743E+02 S¹
 8.8515823E+01 S⁰

NUMERATOR U/CAN
 -2.2967593E+00 S³
 -1.0807091E+02 S²
 -6.978635E+01 S¹
 -5.7100922E+01 S⁰

NUMERATOR ALP/CAN
 -4.4134356E-02 S³
 2.7431936E+00 S²
 3.4181856E-02 S¹
 3.1826764E-02 S⁰

NUMERATOR AN/STRK

-7.0716599E+01 S⁴
 -1.5730957E+01 S³
 9.1102100E+02 S²
 -9.6936321E-01 S¹
 -1.2738001E-01 S⁰

NUMERATOR AN/FLAP
 -1.0832066E+01 S⁴
 7.7807617E-01 S³
 3.5087305E+02 S²
 3.6957264E-01 S¹
 -8.4145546E-02 S⁰

NUMERATOR Q/STRK
 -1.1398735E+00 S³
 -1.0796480E+00 S²
 -2.3349337E-02 S¹
 2.4281780E-07 S⁰

NUMERATOR Q/FLAP
 -1.9728374E+00 S³
 -2.7666025E+00 S²
 -3.5276704E-02 S¹
 1.1211432E-06 S⁰

NUMERATOR THT/STRK
 0.0000000E+00 S³
 -1.1398735E+00 S²
 -1.0796480E+00 S¹
 -2.3349337E-02 S⁰

NUMERATOR THT/FLAP
 0.0000000E+00 S³
 -1.9728374E+00 S²
 -2.7666025E+00 S¹
 -3.5276704E-02 S⁰

NUMERATOR THT/CAN
 0.0000000E+00 S³
 2.7884054E+00 S²
 1.7833910E+00 S¹
 4.8269980E-02 S⁰

NUMERATOR AN/CAN
 -1.9394921E-08 S⁰

NUMERATOR AN/FLAP
 -1.4690653E+01 S⁴
 -1.5049316E+01 S³
 -5.7220630E+02 S²
 9.4742680E-01 S¹
 1.7379308E-01 S⁰

04/09/92 11:45:59 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM
BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-54.2552490	-4.3316641	3.4245672
P	(PER R/S)	.00000000	-2.1210060	-.0906070
R	(PER R/S)	.00000000	1.1002455	-.0716664
AILERON	(PER RAD)	-10.7173338	35.1205597	2.2532625
RUDDER	(PER RAD)	12.3695278	5.41735527	-1.6427412

A Matrix:

BETA	P	R	PHI	AIL	RUD
-1620E+00	-1119E+00	-.9937E+00	.9545E-01	-.3200E-01	.3693E-01
-4332E+01	-.2121E+01	.1100E+01	.0000E+00	.3512E+02	.5417E+01
3425E+01	-.9061E-01	-.7167E-01	.0000E+00	.2253E+01	-.1643E+01
.0000E+00	.1000E+01	.1126E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-1.8475848E-01	/+J(1.9579487E+00)
-1.8475848E-01	/+J(-1.9579487E+00)
-2.0374527E+00	/+J(0.0000000E+00)
5.2320469E-02	/+J(0.0000000E+00)

DYNAMICS

PERIOD= 3.2091 WD= 1.95795
ZETA= .09395 WN= 1.96665

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4

2.3546448E+00 S3

4.4946222E+00 S2

7.6384392E+00 S1

-4.1229576E-01 S0

NUMERATOR BETA/ AIL
3.1995296E-02 S3
-3.1995296E-02 S3
1.6207619E+00 S2
1.3404503E+00 S1
4.9403381E-01 S0

NUMERATOR P/ AIL
3.5120560E+01 S3
1.0823258E+01 S2
1.2991495E+02 S1
-1.3976126E+00 S0

NUMERATOR P/ RUD
5.4173527E+00 S3
-7.0167351E-01 S2
1.1262259E+01 S1
-1.2291557E-01 S0

NUMERATOR AY/ AIL
-1.0650021E+01 S4
-2.6909180E+01 S3
-1.4102808E+02 S2
-2.0988281E+02 S1
-2.2382767E+01 S0

NUMERATOR R/ AIL
2.2532625E+00 S3
1.8524094E+00 S2
1.4564553E+01 S1
1.2411440E+01 S0

NUMERATOR R/ RUD
-1.6427412E+00 S3
-4.1147318E+00 S2
9.1859323E-01 S1
1.0915747E+00 S0

NUMERATOR AY/ RUD
1.2291837E+01 S4
2.2242218E+01 S3
-7.9301193E+01 S2
-1.3844165E+02 S1
4.5676975E+00 S0

NUMERATOR PHI/ AIL
0.0000000E+00 S3
3.5374283E+01 S2
1.1031856E+01 S1
1.3155504E+02 S0

NUMERATOR PHI/ RUD
0.0000000E+00 S3
5.2323656E+00 S2
-1.1650267E+00 S1
-1.13657701E+01 S0

/

04/09/92 11:49:00

TASK # 09000006 MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 1

AIRCRAFT STATE

MACH =	.50000	ALT =	100.00	VTRFPS =	558.28
NZ =	1.00047	ALPHA =	3.76924	BETA =	.00000
GAMMA =	.00000	THETA =	3.76926	ACGW =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYI =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.94386	FLAPS =	.86039	STRAKES=	-4.57629
AILERON=	.00000	RUDDER =	.00000		
THRUST =	2451.833	Z RPM =	13.24040		

DYNAMICS

CAERO =	.0000000	ZAERO =	-.23251498		
CLMAERO=	.0000000	CMMAERO=	.0000000		
VC KTS =	330.176	DYN PR =	369.32739		
AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000

04/09/92 11:49:00 TASK # 03000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

		CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA	(PER RAD)	.3105441	-4.7509108	1.5126143	-0000000
PITCH RATE	(PER RAD)	.0000000	-6.7812767	-7.4658365	-0000000
STRAKE	(PER RAD)	-0317523	-.2093256	-3201184	-0000000
MACH	(PER M #)	.0072588	.0219631	.0359202	180.3588409
ALPHA DOT	(PER RAD)	.0000000	-.4774358	-1.0246849	-0000000
CANARD	(PER RAD)	-.0009524	-.2538229	.8558812	-0000000
FLAPERON	(PER RAD)	.0381018	-1.4610481	-.5628066	-0000000

LATERAL NONDIMENSIONAL DERIVATIVES

		CY BODY	CN	CL
BETA	(PER RAD)	-1.0334225	.2265612	-0526842
ROLL RATE	(PER RAD)	.0000000	-.0082143	-3753325
YAW RATE	(PER RAD)	.0000000	-.1988654	.1484445
AILERON	(PER RAD)	-.2162113	.0853983	.2216526
RUDDER	(PER RAD)	.2257051	-.1312984	.0375782

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 3

LONGITUDINAL SYSTEM
BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		$\frac{^2}{FT/SEC*2}$	$\frac{^3}{RAD/SEC*2}$	$\frac{^4}{M/RAD/SEC*2}$	$\frac{^5}{X/FT/SEC*2}$
ALPHA	(PER RAD)	-657.2287598		15.0522022	42.3515083
ALPHADOT	(PER R/S)	-4244111		-0.0659596	.0000000
0	(PER R/S)	-6.0543032		-4.819348	.0000000
VEL	(PER FT/S)	-0.0348100		-0.013081	-.0139725
STRAKE	(PER RAD)	-28.9012756		-3.1956730	4.383922
FLAPRN	(PER RAD)	-201.7247925		-5.6183786	5.2606630
CANARD	(PER RAD)	-35.0449371		8.5440788	-.1314949

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-1397E-01	-4235E+02	-3670E+02	-3210E+02	-4384E+01	-5261E+01	-1315E+00
-6244E-04	-1179E+01	.9884E+00	-3794E-02	-5184E-01	-3618E+00	-6286E-01
-1304E-02	-1513E+02	-5470E+00	.2499E-03	-3192E+01	-.5595E+01	.8548E+01
.00000E+00	.00000E+00	.10000E+01	.00000E+00	.00000E+00	.00000E+00	.00000E+00

B Matrix:

SYSTEM POLES

$$\begin{aligned} & -6.7486935E+00 \quad ,+j(\quad 0.0000000E+00) \\ & 3.0247660E+00 \quad ,+j(\quad 0.0000000E+00) \\ & -7.9873800E-03 \quad ,+j(\quad 7.3838472E-02) \\ & -7.9873800E-03 \quad ,+j(\quad -7.3838472E-02) \end{aligned}$$

DYNAMICS

$$\begin{aligned} \text{PERIOD} &= 85.0936 \quad WD = .07384 \\ \text{ZETA} &= .10755 \quad WN = .07427 \end{aligned}$$

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D23 PAGE 4

****CHARACTERISTIC POLYNOMIAL****

NUMERATOR	U/STRK	ALP/STRK	Q/STRK	NUMERATOR	THT/STRK	Q/STRK	NUMERATOR	THT/STRK	Q/STRK
4.3839922E+00	S3	-5.1841483E-02	S3	-3.1922588E+00	S3	0.0000000E+00	S3	0.0000000E+00	S3
1.2252643E+02	S2	-3.1845198E+00	S2	-4.5980253E+00	S2	-3.1922588E+00	S2	-4.5980253E+00	S2
7.1826355E+01	S1	-4.2989496E-02	S1	-7.9998374E-02	S1	-4.5980253E+00	S1	-7.9998374E-02	S0
1.4676512E+02	S0	-4.0370971E-03	S0	1.2087951E-05	S0				
5.2606630E+00	S3	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP	Q/FLAP	NUMERATOR THT/FLAP	Q/FLAP	NUMERATOR THT/FLAP
1.9907420E+02	S2	-3.6184257E-01	S3	-5.5945482E+00	S3	0.0000000E+00	S3	0.0000000E+00	S3
3.0473364E+02	S1	-5.7328577E+00	S2	-1.2155059E+01	S2	-5.5945482E+00	S2	-1.2155059E+01	S1
3.8870386E+02	S0	-6.170671E-02	S1	-1.7650610E-01	S1	-1.2155059E+01	S1	-1.7650610E-01	S0
8.5482187E+00	S3	4.2593367E-03	S0	2.1828833E-05	S0				
8.6136229E+00	S2	NUMERATOR ALP/CAN	NUMERATOR Q/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN	Q/CAN	NUMERATOR THT/CAN	Q/CAN	NUMERATOR THT/CAN
1.0792059E-01	S1	1.9312758E-02	S0	1.5391314E-01	S1	8.5482187E+00	S3	0.0000000E+00	S3
1.9312758E-02	S0			-3.1861404E-05	S0	9.2460108E+00	S2	8.5482187E+00	S2
2.0157123E+02	S4	NUMERATOR AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN	NUMERATOR THT/CAN	AN/CAN	NUMERATOR THT/CAN	AN/CAN	NUMERATOR THT/CAN
4.3110352E+00	S3	-2.0157123E+02	S4	-3.5018250E+01	S4	-7.4976563E+01	S3	-7.4976563E+01	S3
2.5307170E+03	S2	-7.7047852E+01	S3	-5.0724648E+03	S2	-5.0724648E+03	S2	-5.0724648E+03	S2
3.2590607E+01	S1	6.7252930E+03	S2	7.4990250E+01	S1	7.4990250E+01	S1	7.4990250E+01	S1
-1.7593437E-01	S0	-3.8547927E-01	S0	3.4328288E-01	S0				

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-142.6832581	-18.5728302	7.3714848
P	(PER R/S)	.0000000	-3.7930794	-.1390026
R	(PER R/S)	.0000000	1.4291840	-.1217285
AILERON	(PER RAD)	-29.8520050	93.1127777	6.2604446
RUDDER	(PER RAD)	31.1628113	13.6843510	-4.1703892

A Matrix:

BETA	P	R	PHI	AIL	AIR	RUD
-.2556E+00	.6574E-01	-.9978E+00	.5751E-01	-.5347E-01	.5582E-01	.0000E+00
-.1857E+02	-.3793E+01	-.1429E+01	.0000E+00	.9311E+02	.1366E+02	.0000E+00
-.7371E+01	-.1390E+00	-.1217E+00	.0000E+00	.6260E+01	-.4170E+01	.0000E+00
.0000E+00	.1000E+01	.6588E-01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

-2.4800354E-01 /+J (2.9022770E+00)
-2.4800354E-01 /+J (-2.9022770E+00)
-3.6932421E+00 /+J (0.0000000E+00)
1.8877365E-02 /+J (0.0000000E+00)

DYNAMICS

PERIOD= 2.1649 WD= 2.90228
ZETA= .08514 WN= 2.91286

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4
4.1703854E+00 S3
1.0237403E+01 S2
3.1141190E+01 S1
-5.9156340E-01 S0

NUMERATOR P/ AIL
9.3112778E+01 S3
4.5072449E+01 S2
8.0565845E+02 S1
-3.0424337E+00 S0

NUMERATOR P/ RUD
1.3684351E+01 S3
-1.8337955E+00 S2
2.2731705E+01 S1
-8.8885069E-02 S0

NUMERATOR AY/ AIL
3.1095413E+01 S4
1.1562158E+02 S3
-4.5625854E+02 S2
-1.6271694E+03 S1
-2.6407089E+01 S0

NUMERATOR P/ AIL
6.2604446E+00 S3
1.2009311E+01 S2
5.3892731E+01 S1
4.6157516E+01 S0

NUMERATOR R/ AIL
0.0000000E+00 S3
9.3525208E+01 S2
4.586332E+01 S1
8.0920898E+02 S0

NUMERATOR R/ RUD
-4.1703892E+00 S3
-1.8375168E+01 S2
-1.2847195E+00 S1
1.3467197E+00 S0

NUMERATOR /

NUMERATOR AY/ RUD
3.1095413E+01 S4
1.1562158E+02 S3
-4.5625854E+02 S2
-1.6271694E+03 S1
-2.6407089E+01 S0

NUMERATOR PHI/ AIL
0.0000000E+00 S3
1.3409604E+01 S2
-3.0443583E+00 S1
2.2647064E+01 S0

04/09/92 11:49:21 TASK # 080000006 MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 1

AIRCRAFT STATE

MACH =	.70000	ALT =	100.00	VTRFPS =	781.59
NZ =	1.00066	ALPHA =	2.72150	BETA =	.00000
GAMMA =	.00000	THETA =	2.72151	ACGW =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IXZ =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.000000	NX =	.000000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.56123	FLAPS =	-.80706	STRAKES=	-4.68337
AILERON=	.000000	RUDDER =	.00000		
THRUST =	4077.173	X RPM =	21.68131		

DYNAMICS

CXAERO =	-.02479227	CYAERO =	.00000000	CZAERO =	-.11874694
CLMAERO=	.00000000	CMMAERO=	.00362189	CMMAERO=	.00000000
VC KTS =	462.285	DYN PR =	723.88159	RHO =	.00236997

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
--------	----------	--------	--------	--------	---------

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	.2655108	-5.4919415	1.7659721	.0000000
PITCH RATE (PER RAD)	.0000000	-7.2726564	-7.8932467	.0000000
STRAKE (PER RAD)	.0235242	-.1774627	-.2696343	.0000000
MACH (PER M #)	.0070645	-.0414199	-.0201787	326.3793945
ALPHA DOT (PER RAD)	.0000000	-.4739501	-1.1184864	.0000000
CANARD (PER RAD)	-.0017511	-.3626418	.96669358	.0000000
FLAPERON (PER RAD)	.0358100	-.1.5469913	-.5789520	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.0359478	.2022488	-.0528047
ROLL RATE (PER RAD)	.0000000	-.0047338	-.4276027
YAW RATE (PER RAD)	.0000000	-.1779084	.13577201
AILERON (PER RAD)	-.2177042	.0771123	.1940505
RUDDER (PER RAD)	.2079746	-.1221348	-.0356349

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 3

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		^Z FT/SEC**2	^M RAD/SEC**2	^X FT/SEC**2
ALPHA	(PER RAD)	-1486.-2680664	34.-4691772	71.-1161194
ALPHADOT	(PER R/S)	-.5910622	-.1008528	.0000000
Q	(PER R/S)	-.09002090	-.7133352	.0000000
VEL	(PER FT/S)	-.0018786	-.0022763	-.0192128
STRAKE	(PER RAD)	-48.-0239563	-5.-2757368	6.-3659945
FLAPRN	(PER RAD)	-418.-6379395	-11.-3279285	9.-6906929
CANARD	(PER RAD)	-.98.1360779	18.-9193268	-.4765867

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-1921E-01	.7112E+02	-.3711E+02	-.3214E+02	.6366E+01	.9691E+01	-.4766E+00
-2404E-05	-.1902E+01	.9876E+00	-.1955E-02	-.6147E-01	-.5358E+00	-.1256E+00
-2276E-02	.3466E+02	-.8129E+00	.1972E-03	-.5270E+01	-.1127E+02	-.1893E+02
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-7.2410278E+00	/+J(0.0000000E+00)
4.-5263805E+00	/+J(0.0000000E+00)
-9.-89985508E-03	/+J(6.-4784050E-02)
-9.-89985508E-03	/+J(-6.-4784050E-02)

DYNAMICS

PERIOD= 96.9866 WD= .06478
ZETA= .15104 WN= .06554

04/09/92 11:49:21 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.023 PAGE 4

CHARACTERISTIC POLYNOMIAL

NUMERATOR U/STRK	1.0000000E+00 S4 2.7344608E+00 S3 -3.2717407E+01 S2 -6.3749021E-01 S1 -1.4075744E-01 S0	NUMERATOR ALP/STRK	-5.2695379E+00 S3 -1.2270535E+01 S2 -2.5253677E-01 S1 -5.4216143E-05 S0	NUMERATOR THT/STRK	0.0000000E+00 S3 -5.2695379E+00 S2 -1.2270535E+01 S1 -2.5253677E-01 S0		
NUMERATOR U/FLAP	6.3659945E+00 S3 2.0846909E+02 S2 3.8688110E+01 S1 3.9178906E+02 S0	NUMERATOR ALP/FLAP	-5.3582478E-01 S3 -1.1580105E+01 S2 -1.7767787E-01 S1 3.8851853E-02 S0	NUMERATOR Q/FLAP	-1.1273890E+01 S3 -4.0257339E+01 S2 -7.2674704E-01 S1 1.9094681E-04 S0	NUMERATOR THT/FLAP	0.0000000E+00 S3 -1.1273890E+01 S2 -4.0257339E+01 S1 -7.2674704E-01 S0
NUMERATOR U/CAN	9.6906929E+00 S3 4.0658618E+02 S2 7.0788794E+02 S1 1.2883340E+03 S0	NUMERATOR ALP/CAN	-1.2560672E-01 S3 1.8592880E+01 S2 3.3363402E-01 S1 9.8378770E-03 S0	NUMERATOR Q/CAN	1.8931992E+01 S3 3.2025665E+01 S2 6.3384253E-01 S1 -1.3016749E-04 S0	NUMERATOR THT/CAN	0.0000000E+00 S3 1.8931992E+01 S2 3.2025665E+01 S1 6.3384253E-01 S0
NUMERATOR AN/STRK	-4.7658670E-01 S3 -7.1280225E+02 S2 -4.4537817E+02 S1 -1.0201667E+03 S0	NUMERATOR AN/FLAP	-4.1832129E+02 S4 -2.3906250E+02 S3 3.1273184E+04 S2 5.362076E+02 S1 -1.2592897E+00 S0	NUMERATOR AN/CAN	-9.8061829E+01 S4 -2.6474219E+02 S3 -2.44713215E+04 S2 -4.3823975E+02 S1 1.0699129E+00 S0	NUMERATOR THT/FLAP	

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

MPX.D23

PAGE

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y	L	N
		FT/SEC**2	RAD/SEC**2	RAD/SEC**2
BETA	(PER RAD)	-280.3422852	-37.1875916	12.7345037
P	(PER R/S)	.00000000	-.0675683	-.2160444
R	(PER R/S)	.00000000	1.8312702	-.1510251
AILERON	(PER RAD)	-58.9138794	159.8407135	10.9076433
RUDDER	(PER RAD)	56.2808990	25.5013428	-7.5842838

A Matrix:

BETA	P	R	PHI	AIL	AIL	RUD	RUD
-3587E+00	-4748E-01	-.9989E+00	-4112E-01	-.7538E-01	.7201E-01	.0000E+00	.0000E+00
-3719E+02	-6048E+01	.1831E+01	.0000E+00	.1598E+03	.2550E+02	.0000E+00	.0000E+00
-1273E+02	-2160E+00	-.1510E+00	.0000E+00	.1091E+02	-.7584E+01	.0000E+00	.0000E+00
.0000E+00	.1000E+01	.4753E-01	.0000E+00	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-3 .0316657E-01	/+J(-3.7920914E+00)
-3 .0316657E-01	/+J(-3.7920914E+00)
-5 .9613857E+00	/+J(0.0000000E+00)
1.0364234E-02	/+J(0.0000000E+00)

DYNAMICS

PERIOD= 1.6569 WD= 3.79209
ZETA= .07969 WN= 3.80419

CHARACTERISTIC POLYNOMIAL ***

1.000000E+00	S4
6.5572767E+00	S3
1.8018143E+01	S2
8.6084122E+01	S1
8.9422387E-01	SO

NUMERATOR BETA / AIL
 -7.5377285E-02 S3
 -3.7731848E+00 S2
 -2.2806900E+01 S1
 1.8753843E+00 S0

NUMERATOR	P / AIL	R / AIL	NUMERATOR	R / AIL	NUMERATOR	P / AIL	R / AIL
1-5984071E+02	S3	1-097643E+01	S3	0.000000E+00	S3	0.000000E+00	S3
1-0425009E+02	S2	3-4384506E+01	S2	1-6035919E+02	S2	1-0588454E+02	S1
2-4528565E+03	S1	1-2077025E+02	S1				

NUMERATOR BETA / RUD	P / RUD	NUMERATOR	R / RUD	NUMERATOR	R / RUD	NUMERATOR	PHI / RUD
7.2008550E-02 S3	2.-5501343E+01 S3	-7.5172838E+00 S3	0.0000000E+00 S3	2.-5140823E+01 S2	-5.3179276E+01 S2	2.-5140823E+01 S2	0.0000000E+00 S3
9.-2329092E+00 S2	-3.5684490E+00 S2	-5.1962360E+01 S1	-6.0963030E+00 S1	-1.-0275864E+01 S1	-1.-0275864E+01 S1	-1.-0275864E+01 S1	-6.0963030E+00 S1
5.1962360E+01 S1	4.0332016E+01 S1	1.-7561102E+00 S0	3.9843552E+01 S0	1.-7561102E+00 S0	1.-7561102E+00 S0	1.-7561102E+00 S0	3.9843552E+01 S0
-5.1317596E-01 S0	-8.3435714E-02 S0						

NUMERATOR	AY / AIL	NUMERATOR	AY / RUD
-5.8847443E+01	S4	5.6217453E+01	S4
-3.6185547E+02	S3	3.4072266E+02	S3
-1.6349121E+01	S2	-1.6201277E+03	S2
1.3205625E+03	S1	-9.72386725E+03	S1
-4.73104985E+02	S0	9.362D514E+D1	S0

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TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

MPX.D23 PAGE 1

AIRCRAFT STATE

MACH =	-90000	ALT =	100.00	VTRFPS =	1004.90
NZ =	.99818	ALPHA =	2.53971	BETA =	.00000
GAMMA =	.00000	THETA =	2.53972	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYI =	1827.00	XCG =	450.56006	ZCG =	64.89000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.79026	FLAPS =	-3.01641	STRAKES=	-4.97670
AILERON=	-00000	RUDDER =	.00000		
THRUST =	7406.086	X RPM =	43.20621		

DYNAMICS

CXAERO =	.000000000	CZAERO =	-.07184625		
CLMAERO=	.000000000	CMMAERO=	.000000000		
VC KTS =	594.425	DYN PR =	1196.62061		
AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000

A/C CONSTANTS

RHO =	.00236997
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04/09/92 11:49:40 TASK # 08000006 MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-023 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

		CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA	(PER RAD)	.2901374	-7.2770729	2.0986538	.0000000
PITCH RATE	(PER RAD)	.0000000	-8.0015907	-8.8425236	.0000000
STRAKE	(PER RAD)	.0086705	-.1324789	-.1364818	.0000000
MACH	(PER M #)	-.0719362	-.3839715	-.0491222	-7836.8359375
ALPHA DOT	(PER RAD)	.0000000	-.4487051	-.12793922	.0000000
CANARD	(PER RAD)	-.0184006	-.5848925	1.2607012	.0000000
FLAPERON	(PER RAD)	.0309399	-.1.5183439	-.6590108	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

		CY BODY	CN	CL
BETA	(PER RAD)	-1.0203457	.1804873	-.0680822
ROLL RATE	(PER RAD)	.0000000	.0013629	-.5398493
YAW RATE	(PER RAD)	.0000000	-.1513517	.1414860
AILERON	(PER RAD)	-.2980995	.0500296	.1285638
RUDDER	(PER RAD)	.1689356	-.1009741	.0310236

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 3

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z	M	X
	FT/SEC**2	RAD/SEC**2	FT/SEC**2
ALPHA (PER RAD)	-3258.6384277	67.6941833	127.0552521
ALPHADOT (PER R/S)	-.7196688	-.1483653	.0000000
Q (PER R/S)	-12.8588362	-1.0274448	.0000000
VEL (PER FT/S)	-.0740439	-.0040359	-.0756097
STRAKE (PER RAD)	-.59.2633972	-.6.0316086	3.8786955
FLAPRN (PER RAD)	-679.2189941	-21.3152008	13.8407316
CANARD (PER RAD)	-261.6472168	40.7764130	-8.2313652

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-.7561E-01	.1271E+03	-.4453E+02	-.3214E+02	.3879E+01	.1384E+02	-.8231E+01
-.7370E-04	-.3244E+01	.9865E+00	-.1419E-02	-.5899E-01	-.6761E+00	-.2604E+00
-.4025E-02	.6818E+02	-.1174E+01	-.2105E-03	-.6023E+01	-.2121E+02	.4082E+02
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

'+J(0.000000E+00)
'+J(0.000000E+00)
'+J(0.000000E+00)
'+J(8.5936368E-02)
'+J(-8.5936368E-02)

DYNAMICS

PERIOD= 73.1144 WD= .08594
ZETA= .42665 WN= .09502

CHARACTERISTIC POLYNOMIAL

1.0000000E+00	S4			
4.4930344E+00	S3			
-6.3282684E+01	S2			
-5.1201115E+00	S1			
-5.7420695E-01	S0			
NUMERATOR U/STRK	ALP/STRK	NUMERATOR Q/STRK	NUMERATOR TNT/STRK	
3.8786955E+00	S3	-5.3902270E-02 S3	-6.0228567E+00 S3	0.0000000E+00 S3
2.7782764E+02	S2	-6.0154419E+00 S2	-2.4028549E+01 S2	-6.0228567E+00 S2
2.3279019E+02	S1	-4.7083360E-01 S1	-1.8774567E+00 S1	-2.4028549E+01 S1
7.5865259E+02	S0	-5.8970228E-03 S0	1.4338866E-04 S0	-1.8774567E+00 S0
NUMERATOR U/FLAP	ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR TNT/FLAP	
1.3840732E+01	S3	-6.7608869E-01 S3	-2.1214890E+01 S3	0.0000000E+00 S3
9.1990723E+02	S2	-2.1773895E+01 S2	-1.1656543E+02 S2	-2.1214890E+01 S2
2.1604639E+03	S1	-1.6167126E+00 S1	-8.7908335E+00 S1	-1.1656543E+02 S1
3.6985046E+03	S0	3.9818518E-02 S0	8.8287168E-04 S0	-8.7908335E+00 S0
NUMERATOR U/CAN	ALP/CAN	NUMERATOR Q/CAN	NUMERATOR TNT/CAN	
-3.2313652E+00	S3	-2.6044136E-01 S3	6.0815048E+01 S3	0.0000000E+00 S3
-1.88668857E+03	S2	3.9938599E+01 S2	1.1775192E+02 S2	4.0815048E+01 S2
-8.1723340E+02	S1	3.1773291E+00 S1	9.3310308E+00 S1	1.1775192E+02 S1
-3.69226934E+03	S0	1.2548280E-01 S0	-4.3806969E-04 S0	9.3310308E+00 S0
NUMERATOR AN/STRK	AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN	
-5.9220947E+01	S4	-6.7873242E+02 S4	-2.6145972E+02 S4	
7.4453125E+00	S3	-5.6119141E+02 S3	-8.7987891E+02 S3	
2.3641250E+04	S2	1.1536794E+05 S2	-1.1496444E+05 S2	
1.8446211E+03	S1	8.6990000E+03 S1	-9.0736719E+03 S1	
-2.8205986E+00	S0	-1.3419224E+01 S0	1.3742829E+01 S0	

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		X	Y	Z	
		FT/SEC**2	FT/SEC**2	FT/SEC**2	
BETA	(PER RAD)	-456.4433594	-83.0087433	17.8068695	
P	(PER R/S)	.00000000	-9.8118830	-.3391372	
R	(PER R/S)	.00000000	2.4760838	-.1487379	
AILERON	(PER RAD)	-133.3524323	175.0079193	11.8228521	
RUDDER	(PER RAD)	75.5719910	36.9504395	-10.2921162	

A Matrix:

BETA	P	R	PHI	AIL	RUD
-454.2E+00	-4431E-01	-9990E+00	.3199E-01	-1327E+00	.7520E-01
-8301E+02	-.9812E+01	.2676E+01	.0000E+00	.1750E+03	.3695E+02
-1731E+02	-.3391E+00	-.1487E+00	.0000E+00	.1822E+02	-.1029E+02
.0000E+00	.1000E+01	.4436E-01	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-9.6807079E+00	/+J (	0.00000000E+00)
-3.7025166E-01	/+J (	4.5882130E+00)
-3.7025166E-01	/+J (	-4.5882130E+00)
6.35337657E-03	/+J (0.00000000E+00)

DYNAMICS

PERIOD= 1.3694 WD= 4.58821
ZETA= .08043 WN= 4.60313

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TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

PAGE 0

CHARACTERISTIC POLYNOMIAL

1.000000E+00 S4

1.041484E+01 S3

2.8291046E+01 S2

2.0493846E+02 S1

-1.3031721E+00 S0

NUMERATOR BETA / AIL

1.7500792E+02 S3

1.4591204E+02 S2

4.1146211E+03 S1

-5.8051500E+00 S0

NUMERATOR P / AIL

1.1822852E+01 S3

5.9659832E+01 S2

1.8038841E+02 S1

1.3106953E+02 S0

NUMERATOR PHI / AIL

0.0000000E+00 S3

1.7553232E+02 S2

1.4845827E+02 S1

4.1226250E+03 S0

NUMERATOR BETA / RUD

3.6950439E+01 S3

-9.4471903E+00 S2

-2.0286311E+02 S1

2.8070343E-01 S0

NUMERATOR P / RUD

-1.0292116E+01 S3

-1.1685205E+02 S2

-4.5005753E+01 S1

-6.2804480E+00 S0

NUMERATOR PHI / RUD

0.0000000E+00 S3

3.6493927E+01 S2

-1.4630171E+01 S1

-2.0485934E+02 S0

NUMERATOR AY / AIL

7.5497787E+01 S4

7.4023755E+02 S3

-3.7568306E+03 S2

-3.6481918E+04 S1

2.6716089E+02 S0

NUMERATOR AY / RUD

1.0292116E+01 S3

-1.1685205E+02 S2

-4.5005753E+01 S1

-6.2804480E+00 S0

NUMERATOR PHI / RUD

0.0000000E+00 S3

3.6493927E+01 S2

-1.4630171E+01 S1

-2.0485934E+02 S0

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TASK # 03000006

U01

MPPX.D23

PAGE

1

MODELS ENCORE COMPUTER CORP. MPX-32 3.5

AIRCRAFT STATE

MACH = .95000	ALT = 100.00	VTRFPS = 1060.72
NZ = .99879	ALPHA = 2.38942	BETA = -00000
GAMMA = .00000	THETA = 2.38943	ACGW = 15926.00
IXX = 4548.00	IYY = 49429.00	IZZ = 52531.00
IXZ = 1827.00	XCG = 450.56006	ZCG = 64.88000
GEAR DOWN:	NY = -0.00000	NX = -0.00000
NORMAL MODE:	DR MODE: F	AR MODE: F

CONTROLS

CANARDS= -2.84744	FLAPS = -3.81803	STRAKES= -4.90025
AILERON= -.00000	RUDDER = .00000	
THRUST = 10094.000	Z RPM = 57.11710	

DYNAMICS

CXAERO = -.03322172	CZAERO = .00000000	CZAERO = -.06449628
CLMAERO= .00000000	CMMAERO= -.00487923	CMMAERO= -00000000
VC KTS = 627.465	DYN PR = 1333.27148	RHO = -00236997

A/C CONSTANTS

AREA = 185.0490	CBAR = 7.2200	SPAN = 27.2000
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04/10/92 08:58:37 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPPX.023 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(CLSS)
ALPHA (PER RAD)	.2862645	-7.7614584	1.7732210	.0000000
PITCH RATE(PER RAD)	.0000000	-8.0908966	-9.0930719	.0000000
STRAKE (PER RAD)	.0080152	-.1237546	-.1820582	.0000000
MACH (PER M #)	-.1556872	-.4183871	-.0366994	-7522.5390625
ALPHA DOT (PER RAD)	.0000000	-.4385120	-1.3459539	.0000000
CANARD (PER RAD)	-.0169569	-.6578407	1.1119719	.0000000
FLAPERON (PER RAD)	.0301778	-1.1464062	-.6421686	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.0196772	.1633657	-.0727537
ROLL RATE (PER RAD)	.0000000	.0134417	-.5389903
YAW RATE (PER RAD)	.0000000	-.1318330	.1582530
AILERON (PER RAD)	-.3320057	.0541682	.10c4506
RUDDER (PER RAD)	.1457419	-.03644976	.0259046

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08:58:37 TASK # 08090006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPPX.D23 PAGE 3

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES
 LONGITUDINAL SYSTEM

		Z FT/SEC**2	M RAD/SEC**2	X FT/SEC**2
ALPHA	(PER RAD)	-3872.7272949	63.7543182	137.7661591
ALPHADOT	(PER R/S)	-.7425607	-.1647926	.0000000
Q	(PER R/S)	-13.7267009	-1.152544	.0000000
VEL	(PER FT/S)	-.0951165	-.0032466	-.1245458
STRAKE	(PER RAD)	-61.6826477	-6.5609875	3.994694
FLAPRN	(PER RAD)	-571.3999023	-23.1423798	15.0414438
CANARD	(PER RAD)	-327.8857422	40.0730591	-8.4517632

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-1245E+00	1378E+03	-4422E+02	-3215E+02	.5995E+01	1504E+02	-8452E+01
-8969E-04	-3652E+01	.9864E+00	-1265E-02	-.5816E-01	.5388E+00	-.3092E+00
-3232E-02	-6436E+02	-1278E+01	-2084E-03	-.6551E+01	-.2305E+02	.4012E+02
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

-1.0526440E+01	/+J (0.0000000E+00)
5.6032991E+00	/+J (0.0000000E+00)
-6.5414846E-02	/+J (7.1679235E-02)
-6.5414846E-02	/+J (-7.1679235E-02)

DYNAMICS

PERIOD= 87.6570 WD= .07168
 ZETA= .67409 WN= .09704

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TASK # 03300000c

PROJECT : INC - COMPOSITE COEF. MAX-32 3.5 U01 MPY.025

>AGE:

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4	NUMERATOR ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
5.0539827E+00 S3	-5.8161277E-02 S3	-6.5514030E+00 S3	0.0000000E+00 S3
-5.8328964E+01 S2	-6.5439548E+00 S2	-2.8495255E+01 S2	-6.5514030E+00 S2
-7.6702490E+00 S1	-8.3563672E-01 S1	-3.5709648E+00 S1	-2.8495255E+01 S1
-5.5542374E-01 S0	-1.1788795E-02 S0	1.0544552E-04 S0	-3.5709648E+00 S0
 NUMERATOR U/STRK	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
3.9949594E+00 S3	-5.3877956E-01 S3	-2.3053589E+01 S3	0.0000000E+00 S3
3.0140063E+02 S2	-2.3496017E+01 S2	-1.2177695E+02 S2	-2.3053589E+01 S2
2.9354063E+02 S1	-2.9526215E+00 S1	-1.5112339E+01 S1	-1.2177695E+02 S1
8.9082836E+02 S0	-6.7544021E-03 S0	3.9149029E-04 S0	-1.5112339E+01 S0
 NUMERATOR U/FLAP	NUMERATOR ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
1.5041444E+01 S3	-3.0916721E-01 S3	4.0124008E+01 S3	0.0000000E+00 S3
1.0194111E+03 S2	3.9143860E+01 S2	1.3164616E+02 S2	6.0124008E+01 S2
1.8851101E+03 S1	5.0604296E+00 S1	1.6552002E+01 S1	1.3164616E+02 S1
3.8260251E+03 S0	1.4141864E-01 S0	-6.0487841E-04 S0	1.6552002E+01 S0
 NUMERATOR U/CAN	NUMERATOR AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN
-8.4517632E+00 S3	-5.7100000E+02 S4	-5.2765625E+02 S4	-5.2765625E+02 S4
-1.8586455E+03 S2	-4.6888672E+02 S3	-1.0387617E+03 S3	-1.0387617E+03 S3
-9.9440063E+02 S1	1.25899338E+05 S2	-1.3410206E+05 S2	-1.3410206E+05 S2
-4.0780413E+03 S0	1.5865586E+04 S1	-1.7215391E+04 S1	-1.7215391E+04 S1
	-2.0686066E+01 S0	2.2843338E+01 S0	2.2843338E+01 S0

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08:58:37

TASK # 03000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-508.2351074	-100.3700409	17.3789825
P	(PER R/S)	.0000000	-11.2917881	-.3707060
R	(PER R/S)	*.0000000	2.9483719	-.1133894
AILERON	(PER RAD)	-165.4807892	162.1175232	12.5582876
RUDDER	(PER RAD)	72.6417542	34.2631989	-9.8583164

A Matrix:

BETA	P	R	PHI	AIL	AIL	RUD	RUD
-.4791E+00	*4169E-01	-.9991E+00	*3031E-01	-.1560E+00	*.6848E-01	.0000E+00	.0000E+00
-.1004E+03	-.1129E+02	*.2948E+01	*.0000E+00	*.1621E+03	*.3426E+02	*.0000E+00	*.0000E+00
*1738E+02	-.3707E+00	-.1134E+00	*.0000E+00	*.1256E+02	-.9858E+01	*.0000E+00	*.0000E+00
*.0000E+00	.1000E+01	*.4173E-01	*.0000E+00	*.0000E+00	*.0000E+00	*.0000E+00	*.0000E+00

B Matrix:

SYSTEM POLES

-1.1146408E+01	*+J (	0.0000000E+00)
-3.7210846E-01	*+J (	4.5856256E+00)
-3.7210846E-01	*+J (	-4.5856256E+00)
6.3711554E-03	*+J (0.0000000E+00)

DYNAMICS

PERIOD= 1.3702 WD= 4.58563
ZETA= .08088 WN= 4.60070

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MODELS

ENCORE COMPUTER CORP. MPX-32 3.5

U01 MPX.D23 PAGE

CHARACTERISTIC POLYNOMIAL

1.00000000E+00 S4
 1.1884316E+01 S3
 2.9386398E+01 S2
 2.3573973E+02 S1
 -1.5031719E+00 S0

NUMERATOR BETA/ AIL
 1.6211752E+02 S3
 1.4874419E+02 S2
 4.0946960E+03 S1
 -5.1479092E+00 S0

NUMERATOR P/ AIL
 3.4263199E+01 S3
 -1.5637726E+01 S2
 -4.0101343E+02 S1
 5.0130177E-01 S0

NUMERATOR R/ AIL
 1.2553238E+01 S3
 8.5013489E+01 S2
 1.7274182E+02 S1
 1.2358406E+02 S0

NUMERATOR PHI/ AIL
 0.0000000E+00 S3
 1.6264154E+02 S2
 1.5229156E+02 S1
 4.1019023E+03 S0

NUMERATOR BETA/ RUD
 6.8483174E-02 S3
 1.2059273E+01 S2
 1.2405035E+02 S1
 -9.2013830E-01 S0

NUMERATOR P/ RUD
 -9.8583164E+00 S3
 -1.2755293E+02 S2
 -5.9862381E+01 S1
 -1.1940517E+01 S0

NUMERATOR PHI/ RUD
 0.0000000E+00 S3
 3.3851837E+01 S2
 -2.0960175E+01 S1
 -4.0551123E+02 S0

NUMERATOR AY/ AIL
 -1.6533691E+02 S4
 -1.8803555E+03 S3
 -9.4767578E+02 S2
 -1.0124375E+03 S1
 -6.5753320E+02 S0

NUMERATOR AY/ RUD
 7.2578644E+01 S4
 8.1737231E+02 S3
 -4.1087070E+03 S2
 -4.5921355E+04 S1
 3.58881543E+02 S0

NUMERATOR AY/ PHI
 /

04/10/92 03:58:58 TASK # 03000006 MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 1

AIRCRAFT STATE

MACH =	.50000	ALT =	10000.00	VTRFPS =	538.94
NZ =	.99925	ALPHA =	4.38708	BETA =	.00000
GAMMA =	.00000	THETA =	4.33710	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYX =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-3.04494	FLAPS =	3.28307	STRAKES=	-5.49912
AILERON=	.00000	RUDDER =	.00000		
THRUST =	2003.690	% RPM =	13.87500		

DYNAMICS

CXAERO =	.00000000	CZAERO =	-.33655757
CLMAERO=	.00000000	CMMAERO=	.00000000
VC KTS =	276.854	DYN PR =	254.96179

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A/C CONSTANTS					
AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000

04/10/92 06:58:58 TASK # 090000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	-3709802	-4.7869196	1.5520849	.0000000
PITCH RATE(PER RAD)	.0000000	-6.7314140	-7.4655275	.0000000
STRAKE (PER RAD)	.0315772	-.2178361	-.3278557	.0000000
MACH (PER M #)	.0026060	.0076967	.0336312	356.5844727
ALPHA DOT (PER RAD)	.0000000	-.4772125	-1.0246563	.0000000
CANARD (PER RAD)	-.0129858	-.2147608	.3620700	.0000000
FLAPERON (PER RAD)	.0381018	-1.4610481	-.5628058	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CL	CN
BETA (PER RAD)	-1.0611315	.2462735
ROLL RATE (PER RAD)	.0000000	-.0144992
YAW RATE (PER RAD)	.0000000	-.2016139
AILERON (PER RAD)	-.2164459	.0844897
RUDDER (PER RAD)	.2375308	-.1394036

04/10/92 08:58:58 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 3

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z FT/SEC**2	M RAD/SEC**2	X FT/SEC**2
ALPHA (PER RAD)	-458.4580078	10.6478081	34.9202728
ALPHADOT (PER R/S)	-3028936	-0.0470233	.00000000
Q (PER R/S)	-4.3295946	-.3446231	.00000000
VEL (PER FT/S)	-.0532582	-.0011805	-.0099922
STRAKE (PER RAD)	-20.7629085	-2.2594261	3.0097570
FLAPRN (PER RAD)	-139.2589264	-3.8735982	3.6316519
CANARD (PER RAD)	-20.4698029	5.9409790	-1.2377377

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-9992E-02	-3492E+02	-4123E+02	-3208E+02	-3010E+01	.3632E+01	-1238E+01
-9906E-04	-.8527E+00	.9914E+00	-.4577E-02	-.3862E-01	-.2590E+00	-.3807E-01
-1176E-02	-1069E+02	-3912E+00	.2152E-03	-.2258E+01	-.3866E+01	-.5943E+01
.00000E+00	.00000E+00	.1000E+01	.00000E+00	.00000E+00	.00000E+00	.00000E+00

B Matrix:

SYSTEM POLES

2.-6514835E+00 /+J (0.00000000E+00)
-3.-8916149E+00 /+J (0.00000000E+00)
-6.-8945885E-03 /+J (7.9574466E-02)
-6.-8945885E-03 /+J (-7.9574466E-02)

DYNAMICS

PERIOD= 78.9598 WD= .07957
ZETA= .08632 WN= .07987

CHARACTERISTIC POLYNOMIAL

NUMERATOR	U/STRK	NUMERATOR ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
3.0097570E+00 S3	-3.8617037E-02 S3	-2.2576103E+00 S3	0.0000000E+00 S3	
9.5466263E+01 S2	-2.2539511E+00 S2	-2.3638706E+00 S2	-2.2576103E+00 S2	
5.9226990E+01 S1	-2.3144443E-02 S1	-3.5786062E-02 S1	-2.3638706E+00 S1	
7.5502930E+01 S0	-5.5972412E-03 S0	2.1545419E-06 S0	-3.5786062E-02 S0	
NUMERATOR	U/FLAP	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
3.6316519E+00 S3	-2.5900835E-01 S3	-3.86664188E+00 S3	0.0000000E+00 S3	
1.5486748E+02 S2	-3.9373884E+00 S2	-6.1080103E+00 S2	-3.86664188E+00 S2	
1.9940871E+02 S1	-2.9165860E-02 S1	-7.0826054E-02 S1	-6.1080103E+00 S1	
1.9536386E+02 S0	-2.3180142E-03 S0	4.0095174E-06 S0	-7.0826054E-02 S0	
NUMERATOR	U/CAN	NUMERATOR ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
-1.2377377E+00 S3	-3.8071889E-02 S3	5.9427691E+00 S3	0.0000000E+00 S3	
-2.4786211E+02 S2	5.8764114E+00 S2	4.7212553E+00 S2	5.9427691E+00 S2	
-1.6485291E+02 S1	5.9128899E-02 S1	7.1236491E-02 S1	4.7212553E+00 S1	
-1.5051492E+02 S0	2.0041022E-02 S0	-5.4730081E-06 S0	7.1236491E-02 S0	
NUMERATOR	AN/STRK	NUMERATOR AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN
-2.0751205E+01 S4	-1.3918044E+02 S4	-2.0458267E+01 S4	-2.0458267E+01 S4	
1.9663036E+00 S3	-3.8136230E+01 S3	-3.56557715E+01 S3	-3.56557715E+01 S3	
1.2522539E+03 S2	3.2570054E+03 S2	-2.4906094E+03 S2	-2.4906094E+03 S2	
1.0604501E+01 S1	2.1780914E+01 S1	-1.5890806E+01 S1	-1.5890806E+01 S1	
-8.9236557E-02 S0	-1.7646515E-01 S0	1.7826176E-01 S0	1.7826176E-01 S0	

04/10/92 09:58:58 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D23 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-101.1411743	-11.5307762	5.6135473
P	(PER R/S)	.0000000	-2.6517696	-.1011655
R	(PER R/S)	.0000000	1.1052389	-.0858497
AILERON	(PER RAD)	-20.6304169	64.9017029	4.3212833
RUDDER	(PER RAD)	22.6401215	10.0269642	-3.0568190

A Matrix:

BETA	P	R	PHI	AIL	AIL	RUD	RUD
-.1877E+00	.7649E-01	-.9971E+00	.5952E-01	-.3828E-01	.4201E-01	.0000E+00	.0000E+00
-.1158E+02	-.2652E+01	.1105E+01	.0000E+00	.6490E+02	.1003E+02	.0000E+00	.0000E+00
.5614E+01	-.1012E+00	-.8585E-01	.0000E+00	.4321E+01	-.3057E+01	.0000E+00	.0000E+00
.0000E+00	.1000E+01	.7672E-01	.0000E+00	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

-1.9003361E-01	/+J (	2.5283260E+00)
-1.9003361E-01	/+J (	-2.5283260E+00)
-2.5684462E+00	/+J (	0.0000000E+00)
2.3223985E-02	/+J (	0.0000000E+00)

DYNAMICS

PERIOD= 2.4851 WD= 2.52833
ZETA= .07495 WN= 2.53546

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4

2.9252863E+00 S3

7.3361835E+00 S2

1.6339218E+01 S1

-3.8346112E-01 S0

NUMERATOR BETA/ AIL

6.4901703E+01 S3

2.2971054E+01 S2

4.1490088E+02 S1

-1.8927374E+00 S0

NUMERATOR P/ AIL

1.0026964E+01 S3

-1.1224680E+00 S2

2.0571686E+01 S1

-9.5429540E-02 S0

NUMERATOR R/ AIL

4.3212833E+00 S3

5.4893131E+00 S2

3.2000549E+01 S1

2.4665054E+01 S0

NUMERATOR PHI/ AIL

0.0000000E+00 S3

6.5233215E+01 S2

2.3392181E+01 S1

4.1735596E+02 S0

NUMERATOR BETA/ RUD

1.0026964E+01 S3

-1.1224680E+00 S2

2.0571686E+01 S1

-9.5429540E-02 S0

NUMERATOR R/ RUD

-3.0568190E+00 S3

-9.4582081E+00 S2

5.6064719E-01 S1

1.2432508E+00 S0

NUMERATOR PHI/ RUD

0.0000000E+00 S3

9.7924490E+00 S2

-1.8480883E+00 S1

2.0614700E+01 S0

NUMERATOR /

NUMERATOR AY/ AIL

2.2573776E+01 S4

5.5773926E+01 S3

-2.4638206E+02 S2

-5.9043335E+02 S1

1.0691689E+01 S0

NUMERATOR AY/ RUD

-2.0569962E+01 S4

-5.7346680E+01 S3

-2.0674951E+02 S2

-3.1608984E+02 S1

-5.6650348E+01 S0

04/10/92 06:59:19 TASK # 08000000 MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 1

AIRCRAFT STATE

MACH =	.70000	ALT =	100000.00	VTRFPS =	754.51
NZ =	.99898	ALPHA =	3.08648	BETA =	.000000
GAMMA =	.00000	THETA =	3.08650	ACGW =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IXZ =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.000000	NX =	.000000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.60869	FLAPS =	-.05130	STRAKES=	-3.79894
AILERON=	.00000	RUDDER =	.00000		
THRUST =	2870.434	% RPM =	19.01076		

DYNAMICS

CAERO =	.00000000	CYAERO =	.00000000	CZAERO =	-.17198908
CLMAERO=	.00000000	CMMAERO=	.00370841	CNMAERO=	.00000000
VC KTS =	390.706	DYN PR =	499.72461	RHO =	.00175561

49 ***A/C CONSTANTS***

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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04/10/92 09:59:18 TASK # 0300000e MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 4PX.D23 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	-2805251	-5.2550144	1.7002331	.0000000
PITCH RATE(PER RAD)	.0000000	-7.2726946	-7.8930044	.0000000
STRAKE (PER RAD)	.0223656	-.1955577	-.2842008	.0000000
MACH (PER M #)	.0050186	-.0621646	.0104233	762.3315430
ALPHA DOT (PER RAD)	.0000000	-.4739495	-1.1184864	.0000000
CANARD (PER RAD)	-.0030734	-.3219798	.9120272	.0000000
FLAPERON (PER RAD)	.0353100	-1.5469923	-.5789520	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.0534906	.2154524	-.0538382
RCLL RATE (PER RAD)	.0000000	-.0087045	-.3996911
YAW RATE (PER RAD)	.0000000	-.1813709	.1437543
AILERON (PER RAD)	-.2178183	.0770122	.1979908
RUDDER (PER RAD)	.2276835	-.1338190	.0390402

04/10/92

08:59:18

TASK # 030000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5

U01 MPX.D2?

PAGE 3

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		² FT/SEC**2	⁴ RAD/SEC**2	⁶ FT/SEC**2
ALPHA (PER RAD)		-982.7670898	22.3104767	51.8526766
ALPHADOT (PER R/S)		-4224.018	.0720745	.0000000
Q (PER R/S)		-6.5005434	-.5100984	.0000000
VEL (PER FT/S)		-.0257472	-.0013882	-.0122058
STRAKE (PER RAD)		-36.5332794	-.3.8388081	.4.1782598
FLAPRN (PER RAD)		-289.0029297	-7.8201237	6.6898737
CANARD (PER RAD)		-60.1509552	12.3190975	-.5741571

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-1221E-01	.5185E+02	-.4063E+02	-.3213E+02	.4173E+01	.6690E+01	-.5742E+00
-3415E-04	-.1304E+01	*9903E+00	-.2298E-02	-.4846E-01	-.3834E+00	-.7979E-01
-1386E-02	-2300E+02	-.5815E+00	*1656E-03	-.3835E+01	-.7792E+01	.1232E+02
*0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-5.7359972E+00	/+J(0.0000000E+00)
3.8522081E+00	/+J(0.0000000E+00)
-6.8098679E-03	/+J(6.0807392E-02)
-6.8098679E-03	/+J(-6.0807392E-02)

DYNAMICS

PERIOD=103.3293 WD= .06081
 ZETA= .11130 WN= .06119

CHARACTERISTIC POLYNOMIAL

NUMERATOR U/STRK	ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
4.1792598E+00 S3	-4.8462857E-02 S3	-3.9353148E+00 S3	0.0000000E+00 S3
1.6117412E+02 S2	-3.9290100E+00 S2	-6.1674843E+00 S2	-3.8353148E+00 S2
3.1061066E+01 S1	-4.6317209E-02 S1	-8.8720918E-02 S1	-6.1674843E+00 S1
1.9712996E+02 S0	-1.3746483E-03 S0	2.4686960E-05 S0	-8.8720918E-02 S0
NUMERATOR U/FLAP	ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
6.6898737E+00 S3	-3.8337398E-01 S3	-7.7924919E+00 S3	0.0000000E+00 S3
3.0930371E+02 S2	-7.9487743E+00 S2	-1.9082611E+01 S2	-7.7924919E+00 S2
4.6202100E+02 S1	-7.7531457E-02 S1	-2.3512155E-01 S1	-1.9082611E+01 S1
6.109902E+02 S0	8.8677257E-03 S0	1.4612412E-04 S0	-2.3512155E-01 S0
NUMERATOR U/CAN	ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
-5.7415712E-01 S3	-7.9792678E-02 S3	1.2324348E+01 S3	0.0000000E+00 S3
-5.0591870E+02 S2	1.2164309E+01 S2	1.4383293E+01 S2	1.2324848E+01 S2
-3.3069116E+02 S1	1.4256889E-01 S1	2.0257962E-01 S1	1.4383293E+01 S1
-4.5872925E+02 S0	1.6549437E-02 S0	2.9924634E-07 S0	2.0257962E-01 S0
NUMERATOR AN/STRK	NUMERATOR AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN
-3.6512817E+01 S4	-2.8884106E+02 S4	-6.0117279E+01 S4	-6.0117279E+01 S4
4.7500000E+00 S3	-1.1774609E+02 S3	-1.2095313E+02 S3	-1.2095313E+02 S3
4.6051563E+03 S2	1.4305277E+04 S2	-1.0707871E+04 S2	-1.0707871E+04 S2
5.4747391E+01 S1	1.5076866E+02 S1	-1.1524176E+02 S1	-1.1524176E+02 S1
-1.7229456E-01 S0	-5.1740390E-01 S0	3.5071158E-01 S0	3.5071158E-01 S0

04/10/92 08:59:13 TASK # 0300006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

	Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
3ETA (PER RAD)	-196.8089447	-25.9942017	9.4121571
P (PER R/S)	.0000000	-.0439014	-.1481572
R (PER R/S)	.0000000	1.3805693	-.1082057
AILERON (PER RAD)	-40.6919403	112.5526428	7.6019907
RUDDER (PER RAD)	42.5349426	19.2866974	-5.736943

A Matrix:

	P	R	PHI	AIL	RUD
3ETA	-.2608E+00	.5384E-01	-.9985E+00	.4258E-01	-.5393E-01
P	-.2599E+02	-.4044E+01	.1390E+01	.0000E+00	.1126E+03
R	.9412E+01	-.1432E+00	-.1082E+00	.0000E+00	.7602E+01
AILERON	.0000E+00	.1000E+01	.5392E-01	.0000E+00	.0000E+00
RUDDER					

B Matrix:

	P	R	PHI	AIL	RUD
3ETA	-.22.2881031E-01	r+j(3.2728939E+00)			
P	-.2.2881031E-01	r+j(-3.2728939E+00)			
R	-3.9677877E+00	r+j(0.0000000E+00)			
AILERON	1.2488514E-02	r+j(0.0000000E+00)			
RUDDER					

SYSTEM POLES

-2.2881031E-01 r+j(3.2728939E+00)
-2.2881031E-01 r+j(-3.2728939E+00)
-3.9677877E+00 r+j(0.0000000E+00)
1.2488514E-02 r+j(0.0000000E+00)

DYNAMICS

PERIOD= 1.9198 WD= 3.27289
ZETA= .06974 WN= 3.28038

04/10/92 OS:59:18 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA/ AIL
1.0000000E+00 S4
4.129496E+00 S3
1.2524604E+01 S2
4.2552582E+01 S1
-5.3337663E-01 S0

NUMERATOR P/ AIL
1.1255264E+02 S3
5.3502731E+01 S2
1.2605264E+03 S1
-2.8868961E+00 S0

NUMERATOR P/ RUD
1.9286697E+01 S3
-2.3192139E+00 S2
3.1405411E+01 S1
-7.4554622E-02 S0

NUMERATOR AY/ AIL
-4.0632935E+01 S4
-1.6703906E+02 S3
-1.5549805E+02 S2
-1.4910938E+02 S1
-1.7523112E+02 S0

NUMERATOR R/ AIL
7.6019907E+00 S3
1.5541523E+01 S2
6.9087585E+01 S1
5.3522064E+01 S0

NUMERATOR R/ RUD
-5.7366943E+00 S3
-2.7021866E+01 S2
-2.6887493E+00 S1
1.3800144E+00 S0

NUMERATOR PHI/ AIL
0.0000000E+00 S3
1.1296254E+02 S2
5.4340744E+01 S1
1.2642515E+03 S0

NUMERATOR PHI/ RUD
0.0000000E+00 S3
1.8977356E+01 S2
-3.7762632E+00 S1
3.1260437E+01 S0

04/10/92 08:59:37

TASK # 080000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

PAGE 1

MPX.D23

AIRCRAFT STATE

MACH =	.90000	ALT =	10000.00	VTRFPS =	970.09
NZ =	.99633	ALPHA =	2.82944	BETA =	.00000
GAMMA =	.00000	THETA =	2.82945	ACGW =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYI =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AP MODE:	F

CONTROLS

CANARDS=	-3.22420	FLAPS =	-2.98074	STRAKES=	-2.66410
AILERON=	.00000	RUDDER =	.00000		
THRUST =	5079.176	% RPM =	32.59435		

DYNAMICS

CXAERO =	.00000000	CZAERO =	-.10405451		
CLMAERO=	.00000000	CNMAERO=	.00000000		
VC KTS =	507.130	DYN PR =	826.07471		
			RHO = .00175561		
			A/C CONSTANTS		
AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000

04/10/92 08:59:37 TASK # 03000006 MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

		CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA	(PER RAD)	.29997032	-6.6399498	1.9332123	.0000000
PITCH RATE (PER RAD)		.00000000	-8.0015631	-9.8423271	.0000000
STRAKE	(PER RAD)	.0074209	-.1602557	-.1974170	.0000000
YACH	(PER M H)	-.0734413	-.3259748	-.0521473	270.5078125
ALPHA DOT	(PER RAD)	.00000000	-.448730	-.2793684	.0000000
CANARD	(PER RAD)	-.0131636	-.4665840	1.1169062	.0000000
FLAPERON	(PER RAD)	.0309398	-.1.5183449	-.6590127	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

		CY BODY	CN	CL
9ETA	(PER RAD)	-1.0427599	.1939430	-.0714840
ROLL RATE (PER RAD)		.00000000	-.0018275	-.4675964
YAW RATE (PER RAD)		.00000000	-.1550213	.1507193
AILERON	(PER RAD)	-.2978753	.0505683	.1375768
RUDDER	(PER RAD)	.1948928	-.1155093	.0359199

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BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES
LONGITUDINAL SYSTEM

		² FT/SEC**2	³ RAD/SEC**2	⁴ FT/SEC**2	⁵ FT/SEC**2
ALPHA	(PER RAD)	-2053.1762695	4.3.0176086	90.4667358	
ALPHADOT	(PER R/S)	-.5144659	-.1060455	-.0000000	
Q	(PER R/S)	-9.1954689	-.7347212	-.0000000	
VEL	(PER FT/S)	-.0551082	-.0030980	-.0430771	
STRAKE	(PER RAD)	-.49.4898529	-.4.4080257	2.2917156	
FLAPRN	(PER RAD)	-468.3925781	-14.7147722	9.5547733	
CANARD	(PER RAD)	-144.0895996	24.9389428	-4.0651712	

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-4308E-01	.9047E+02	-6789E+02	-.3213E+02	.2292E+01	.9555E+01	-.4065E+01
-5685E-04	-.2118E+01	-9900E+00	-.1638E-02	-.5105E-01	-.4837E+00	-.1486E+00
-.3092E-02	.4324E+02	-.8397E+00	.1737E-03	-.4403E+01	-.1466E+02	-.2495E+02
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

$$\begin{aligned} s + & 1095190E+00 & ,+J(& 0.0000000E+00) \\ -8.0625048E+00 & ,+J(& 0.0000000E+00) \\ -2.3866307E-02 & ,+J(& 8.0089688E-02) \\ -2.3866307E-02 & ,+J(& -8.0089688E-02) \end{aligned}$$

DYNAMICS

$$\begin{aligned} \text{PERIOD} &= 78.4519 & \text{WD} &= .08009 \\ \text{ZETA} &= .28558 & \text{WN} &= .08357 \end{aligned}$$

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CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4

3.0007257E+00 S3

-4.1046341E+01 S2

-1.9406340E+00 S1

-2.8653420E-01 S0

NUMERATOR U/STRK

2.2917156E+00 S3

2.1298373E+02 S2

2.0149229E+02 S1

3.7139160E+02 S0

NUMERATOR ALP/STRK

-5.1051043E-02 S3

-4.4037123E+00 S2

-1.9392389E+01 S1

-2.5919853E-03 S0

NUMERATOR U/FLAP

9.5547733E+00 S3

6.86667969E+02 S2

1.2178918E+03 S1

1.6729531E+03 S0

NUMERATOR ALP/FLAP

-4.8368412E-01 S3

-1.4944140E+01 S2

-6.1670989E-01 S1

2.2542518E-02 S0

NUMERATOR AN/CAN

-4.0651712E+00 S3

-1.2204497E+03 S2

-6.3457568E+02 S1

-1.49582289E+03 S0

NUMERATOR ALP/CAN

-1.4863503E-01 S3

2.4573669E+01 S2

1.1205330E+00 S1

5.8258414E-02 S0

NUMERATOR AN/STRK

-6.9463593E+01 S4

-1.06664063E+00 S3

1.11691388E+04 S2

4.8821997E+02 S1

-9.11677915E-01 S0

NUMERATOR Q/STRK

-4.4025117E+00 S3

-1.1723784E+01 S2

-5.2570617E-01 S1

7.9218327E-05 S0

NUMERATOR Q/FLAP

-1.4663480E+01 S3

-5.2633209E+01 S2

-2.2647543E+00 S1

4.3664919E-04 S0

NUMERATOR Q/CAN

-1.4954605E+01 S3

4.7512680E+01 S2

2.2060394E+00 S1

-2.0742866E-04 S0

NUMERATOR AN/FLAP

-6.6864380E+02 S4

-2.7193559E+02 S3

5.0375746E+04 S2

2.1325811E+03 S1

-4.0199451E+00 S0

NUMERATOR AN/CAN

-1.4401320E+02 S4

-3.6908984E+02 S3

-4.4909938E+04 S2

-2.0055359E+03 S1

3.7046003E+00 S0

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LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-322.0231934	-60.0243530	13.2632236
P	(PER R/S)	.00000000	-6.0788536	-.2134472
R	(PER R/S)	.00000000	1.8890333	-.10c3198
AILERON	(PER RAD)	-91.9892883	129.1889191	8.4956694
RUDDER	(PER RAD)	60.13664319	29.5793915	-8.1139545

A Matrix:

BETA	P	R	PHI	AIL	RUD
-.3320E+00	-4936E-01	.9988E+00	-3313E-01	-.9483E-01	.6204E-01
-.6002E+02	-.6079E+01	.1889E+01	.0000E+00	.1292E+03	.2958E+02
-.1326E+32	-.2134E+00	-.1063E+00	.0000E+00	.8496E+01	-.8114E+01
-.00000E+00	-.1000E+01	.4942E-01	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

-2.8748512E-01 /+J (3.9827080E+00)
-2.8748512E-01 /+J (-3.9827080E+00)
-5.9503202E+00 /+J (0.0000000E+00)
8.1319362E-03 /+J (0.0000000E+00)

DYNAMICS

PERIOD= 1.5776 WD= 3.98271
ZETA= .07200 WN= 3.99307

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MODELS

ENCORE COMPUTER CORP.

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U01

CHARACTERISTIC POLYNOMIAL

1.0000000E+00	S4
6.5171261E+00	S3
1.9312714E+01	S2
9.4716583E+01	S1
-7.7154928E-01	S0

NUMERATOR BETA/ AIL	P / AIL	NUMERATOR R / AIL	NUMERATOR PHI / AIL
1.2918892E+02 S3	1.2918892E+02 S3	8.4956694E+00 S3	0.0000000E+00 S3
7.8360397E+01 S2	7.8360397E+01 S2	2.5631378E+01 S2	1.2960880E+02 S2
2.2288140E+03 S1	2.2288140E+03 S1	1.0888292E+02 S1	7.9627182E+01 S1
-3.6399517E+00 S0	-3.6399517E+00 S0	7.3651794E-01 S0	2.2341953E+03 S0

NUMERATOR BETA/ RUD	P / RUD	NUMERATOR R / RUD	NUMERATOR PHI / RUD
2.9579391E+01 S3	2.9579391E+01 S3	-8.1139545E+00 S3	0.0000000E+00 S3
-6.0877457E+00 S2	-6.0877457E+00 S2	-5.7507751E+01 S2	2.9178375E+01 S2
-9.7486969E+01 S1	-9.7486969E+01 S1	-1.7347321E+01 S1	-8.9299488E+00 S1
1.55223255E-01 S0	1.55223255E-01 S0	-3.1374454E+00 S0	-9.8344315E+01 S0

NUMERATOR AY/ AIL	AY / AIL	NUMERATOR R / RUD	NUMERATOR PHI / RUD
6.0113052E+01 S4	6.0113052E+01 S4	-8.1139545E+00 S3	0.0000000E+00 S3
3.6049954E+02 S3	3.6049954E+02 S3	-5.7507751E+01 S2	2.9178375E+01 S2
-2.1073291E+03 S2	-2.1073291E+03 S2	-1.7347321E+01 S1	-8.9299488E+00 S1
-1.2331961E+04 S1	-1.2331961E+04 S1	-3.1374454E+00 S0	-9.8344315E+01 S0

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5

U01 MPX.D23

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AIRCRAFT STATE

MACH =	1.10000	ALT =	10000.00	VTRFPS =	1185.66
NZ =	.99837	ALPHA =	2.43410	BETA =	.00000
GAMMA =	.00000	THETA =	2.43411	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IY2 =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.78435	FLAPS =	-3.60885	STRAKES=	-4.59618
AILERON=	.00000	RUDDER =	.00000		
THRUST =	13910.262	% RPM =	86.54823		

DYNAMICS

XAERO =	-.05795356	YAERO =	.00000000	ZAERO =	-.06968403
LAERO=	.00000000	MAERO=	.00725945	NAERO=	.00000000
VC KTS =	625.694	DYN PR =	1234.01392	RHO =	.00175561
AREA =	185.0490				
		A/C CONSTANTS			
		CBAR =	7.2200	SPAN =	27.2000

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CN	THRUST (LBS)
ALPHA (PER RAD)	*2562799	-7.3732319	*7643240	.0000000
PITCH RATE (PER RAD)	*0000000	-7.0114536	-9.1287146	.0000000
STRAKE (PER RAD)	*0044665	-.1124151	-.1950133	.0000000
MACH (PER M #)	-.0398733	.2354351	.0818803	3771.1708984
ALPHA DOT (PER RAD)	*0000000	-.4071600	-1.5345621	.0000000
CANARD (PER RAD)	-.0144666	-.7776472	.7617968	.0000000
FLAPERON (PER RAD)	*0278860	-.65557210	-.5147502	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
ETA (PER RAD)	-1.1135759	*1853496	-.0750934
ROLL RATE (PER RAD)	*0000000	.0702794	-.6063483
YAW RATE (PER RAD)	*0000000	-.3829870	.2318162
AILERON (PER RAD)	-.3548137	.0773319	.0668529
RUDDER (PER RAD)	*0863965	-.0593754	.0158330

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z	M	X
	FT/SEC**2	RAD/SEC**2	FT/SEC**2
ALPHA (PER RAD)	-3392.9519043	25.5960388	114.8867187
ALPHADOT (PER R/S)	-5708611	-1555632	.00000000
Q (PER R/S)	-9.8482094	-9270774	.00000000
VEL (PER FT/S)	-1683347	.0019655	-.0592737
STRAKE (PER RAD)	-51.8594666	-6.5046644	2.0605059
FLAPRN (PER RAD)	-302.4980469	-17.1694794	12.8663827
CANARD (PER RAD)	-358.7451172	25.4097137	-6.6737537

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-5927E-01	-1149E+03	-5036E+02	-3214E+02	.2061E+01	.1286E+02	-.6674E+01
-1420E-03	-2863E+01	.9912E+00	-.1153E-02	-.4376E-01	-.25552E+00	-.3027E+00
-1943E-02	-2604E+02	-.1081E+01	.1794E-03	-.6498E+01	-.1713E+02	-.2546E+02
.00000E+00	.00000E+00	.10000E+01	.00000E+00	.00000E+00	.00000E+00	.00000E+00

B Matrix:

SYSTEM POLES

-7.1260204E+00	/+J (0.00000000E+00)
3.1658268E+00	/+J (0.00000000E+00)
-1.3889593E-01	/+J (0.00000000E+00)
9.5684230E-02	/+J (0.00000000E+00)

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4

4.0034018E+00 S3

-2.2401794E+01 S2

-1.0270939E+00 S1

2.9983753E-01 S0

NUMERATOR U/STRK

2.0605059E+00 S3

3.3030229E+02 S2

4.1078174E+02 S1

6.3552344E+02 S0

NUMERATOR ALP/STRK

-4.3757215E-02 S3

-6.4903488E+00 S2

-3.3059347E-01 S1

2.7613007E-02 S0

NUMERATOR ALP/FLAP

-2.5523734E-01 S3

-1.7268478E+01 S2

-8.-78668649E-01 S1

6.3511431E-02 S0

NUMERATOR ALP/CAN

-3.0269665E-01 S3

2.4886810E+01 S2

1.2213840E+00 S1

-1.3701791E-01 S0

NUMERATOR AN/FLAP

-3.0235229E+02 S4

-1.-6430469E+02 S3

6.-6075063E+04 S2

3.-5029617E+03 S1

-4.-1412086E+00 S0

NUMERATOR AN/STRK

-5.-1834488E+01 S4

8.-8945313E+00 S3

2.-3437160E+04 S2

1.-2544739E+03 S1

-1.-4683971E+00 S0

NUMERATOR Q/STRK

-6.-4978571E+00 S3

-2.-0123077E+01 S2

-1.-0547905E+00 S1

2.-2875916E-05 S0

NUMERATOR Q/FLAP

-1.-7129776E+01 S3

-5.-6677155E+01 S2

-2.-9589672E+00 S1

-2.-9589672E+00 S0

NUMERATOR Q/CAN

2.-5456802E+01 S3

6.-6492432E+01 S2

3.-3076239E+00 S1

-1.-3378855E-05 S0

NUMERATOR AN/CAN

-3.-5857227E+02 S4

-6.-7520703E+02 S3

-7.-7284875E+04 S2

-3.-9896414E+03 S1

4.-5354872E+00 S0

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		<i>Y</i> FT/SEC**2	<i>L</i> RAD/SEC**2	<i>N</i> RAD/SEC**2
BETA	(PER RAD)	-513.7160645	-95.0792999	18.6086426
P	(PER R/S)	.000000000	-9.5942173	-.2393662
R	(PER R/S)	.000000000	3.4712467	-.3986934
AILERON	(PER RAD)	-163.6831055	96.3195496	12.4935436
RUDDER	(PER RAD)	39.8565521	19.0692596	-6.3572369

A Matrix:

BETA	P	R	PHI	AIL	RUD
-4333E+00	-4247E-01	-9991E+00	.2711E-01	-1381E+00	.3362E-01
-9503E+02	-.9594E+01	.3471E+01	.0000E+00	.9632E+02	.1907E+02
-1861E+02	-.2384E+00	-.3987E+00	.0000E+00	.1249E+02	-.6357E+01
.0000E+00	.1000E+01	.4251E-01	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

-9.3808517E+00	/+J(	0.0000000E+00)
-5.2501249E-01	/+J(	4.-6406145E+00)
-5.2501249E-01	/+J(	-4.-6406145E+00)
4.-66693087E-03	/+J(0.0000000E+00)

DYNAMICS

PERIOD= 1.3540 WD= 4.64061
 ZETA= .11242 WN= 4.67022

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA/ AIL	NUMERATOR P/ AIL	NUMERATOR R/ AIL	NUMERATOR PHI/ AIL
-1.3805199E-01 S3	9 -6319550E+01 S3	1 -2493544E+01 S3	0 -0000000E+00 S3
-9.7711143E+00 S2	1 -3662868E+02 S2	9 -9750595E+01 S2	9 -6350616E+01 S2
-9.1362747E+01 S1	3 -0093081E+03 S1	1 -4078247E+02 S1	1 -4086891E+02 S1
2.32886266E+00 S0	-3 -4341450E+00 S0	8 -0798737E+01 S0	3 -0152925E+03 S0
NUMERATOR BETA/ RUD	NUMERATOR P/ RUD	NUMERATOR R/ RUD	NUMERATOR PHI/ RUD
3.3615414E-02 S3	1.9069260E+01 S3	-6 -3572369E+00 S3	0 -0000000E+00 S3
7.4972878E+00 S2	-9 -3986845E+00 S2	-6 -7667068E+01 S2	1 -8799011E+01 S2
6.5530777E+01 S1	-2 -5473346E+02 S1	-3 -2232559E+01 S1	-1 -2275104E+01 S1
-4.6772391E-01 S0	2.8806537E-01 S0	-6 -7666521E+00 S0	-2 -5610376E+02 S0
NUMERATOR AY/ AIL	NUMERATOR AY/ RUD	NUMERATOR /	
-1 -6353542E+02 S4	3 -9820587E+01 S4		
-1 -6252148E+03 S3	3 -9026050E+02 S3		
-5.7023438E+01 S2	-2 -616653E+03 S2		
1 -34666000E+04 S1	-2 -5514801E+04 S1		
-1 -0398355E+03 S0	2.0220926E+02 S0		

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 1

AIRCRAFT STATE

MACH =	.50000	ALT =	20000.00	VTRFPS =	516.69
NZ =	.99710	ALPHA =	5.39862	BETA =	.00000
GAMMA =	.00000	THETA =	5.39865	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IY _Z =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-3.29467	FLAPS =	6.93343	STRAKES=	-6.84897
AILERON=	.00000	RUDDER =	.00000		
THRUST =	1776.878	% RPM =	17.14639		

DYNAMICS

CXAERO =	.00000000	CZAERO =	-.50259894
CLMAERO=	.00000000	CMMAERO=	.00000000
VC KTS =	227.978	DYN PR =	170.48216
		RHO =	.00126733

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	.4467096	-4.8793049	1.6163874	.0000000
PITCH RATE(PER RAD)	.0000000	-6.7813272	-7.4650373	.0000000
STRAKE (PER RAD)	.0333331	-2229946	-.3313628	.0000000
MACH (PER M #)	-.0055740	-.0170433	.0329146	670.4199219
ALPHA DOT (PER RAD)	.0000000	-.4774405	-1.0246820	.0000000
CANARD (PER RAD)	-.0408038	-.2019234	.8644326	.0000000
FLAPERON (PER RAD)	.0381018	-.1.4610481	-.5628066	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.0985174	.2724704	-.0451063
ROLL RATE (PER RAD)	.0000000	-.0244648	-.3524559
YAW RATE (PER RAD)	.0000000	-.2030303	.1798469
AILERON (PER RAD)	-.2164487	.0828704	.2274385
RUDDER (PER RAD)	.2489456	-.1458371	.0417726

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z	M	X
	FT/SEC**2	RAD/SEC**2	FT/SEC**2
ALPHA (PER RAD)	-314.2700195	7.3954010	28.0959320
ALPHADOT (PER R/S)	-2099026	-0.0325720	.0000000
Q (PER R/S)	-3.0079775	-2394138	.0000000
VEL (PER FT/S)	-0.0675997	-0.0010979	-.0063593
VEL (PER FT/S)	-14.2120428	-1.5269432	2.1244049
STRAKE (PER RAD)	-93.1165009	-2.5934525	2.4283314
FLAPRN (PER RAD)	-12.3691177	3.9833670	-2.6005363
CANARD (PER RAD)			

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-6359E-02	.2810E+02	-4880E+02	-3203E+02	.2124E+01	.2428E+01	-.2601E+01
-1309E-03	-.6083E+00	.938E+00	-.5860E-02	-.2751E-01	-.1802E+00	-.2491E-01
-1094E-02	.7415E+01	-.2718E+00	.1909E-03	-.1526E+01	-.2588E+01	.3984E+01
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

2.2938814E+00	/+J(0.0000000E+00)
-3.1676865E+00	/+J(0.0000000E+00)
-6.3389465E-03	/+J(8.4609926E-02)
-6.3389465E-03	/+J(-8.4609926E-02)

DYNAMICS

PERIOD= 74.2606 WD= .08461
ZETA= -.07471 WN= -.08485

CHARACTERISTIC POLYNOMIAL

NUMERATOR U/STRK	ALP/STRK	Q/STRK	NUMERATOR THT/STRK
1.0000000E+00 S4	-1.5260468E+00 S3	0.0000000E+00 S3	
8.-8648432E-01 S3	-1.1443844E+00 S2	-1.5260468E+00 S2	
-7.-2479744E+00 S2	-1.5440047E-02 S1	-1.1443844E+00 S1	
-8.-5792065E-02 S1	2.0166237E-07 S0	-1.5440047E-02 S0	
-5.-2293658E-02 S0			
NUMERATOR U/FLAP	ALP/FLAP	Q/FLAP	NUMERATOR THT/FLAP
2.1246049E+00 S3	-1.8024844E-01 S3	-2.5875816E+00 S3	0.0000000E+00 S3
7.-5568649E+01 S2	-2.-6219158E+00 S2	-2.-9298267E+00 S2	-2.-5875816E+00 S2
4.-6018127E+01 S1	-1.-1097185E-02 S1	-2.-6455391E-02 S1	-2.-9298267E+00 S1
3.6614212E+01 S0	-4.-4180788E-03 S0	8.-63339224E-07 S0	-2.-6455391E-02 S0
NUMERATOR U/CAN	ALP/CAN	Q/CAN	NUMERATOR THT/CAN
-2.-6005363E+00 S3	-2.-4911147E-02 S3	3.-9841785E+00 S3	0.0000000E+00 S3
1.-9741864E+02 S2	3.-9527712E+00 S2	2.-2672024E+00 S2	3.-9841785E+00 S2
-1.-0709811E+02 S1	3.-1485144E-02 S1	3.-3903100E-02 S1	2.-2672024E+00 S1
-7.-2487122E+01 S0	1.-7404839E-02 S0	-1.-4674549E-07 S0	3.-3903100E-02 S0
NUMERATOR AN/STRK	AN/FLAP	AN/CAN	NUMERATOR THT/CAN
-1.-4206268E+01 S4	-9.-3078644E+01 S4	-1.-2863889E+01 S4	0.0000000E+00 S4
8.-1347656E-01 S3	-1.-729736E+01 S3	-1.-6218262E+01 S3	-1.-2863889E+01 S3
5.-8044067E+02 S2	1.-4993726E+03 S2	-1.-1424438E+03 S2	-1.-6218262E+01 S2
1.-7404633E+00 S1	2.-5111246E+00 S1	-1.-6566048E+00 S1	-1.-1424438E+03 S1
-4.-6841983E-02 S0	-8.-0527723E-02 S0	1.-0270226E-01 S0	-1.-6566048E+00 S0

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LATERAL-DIR. SYSTEM
BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-70.0114746	-6.8176937	4.2136688
P	(PER R/S)	.00000000	-1.7725754	-.0721275
R	(PER R/S)	.00000000	.8668829	-.0568079
AILERON	(PER RAD)	-13.7948589	44.0713043	2.8864584
RUDDER	(PER RAD)	15.88659735	7.0225477	-2.1379986

A Matrix:

BETA	P	R	PHI	AIL	RUD
-1.350E+00	.9408E-01	-.9956E+00	.6175E-01	-.2660E-01	.3059E-01
-.6818E+01	-.1773E+01	.86669E+00	.0000E+00	.4407E+02	.7023E+01
-.4214E+01	-.7213E-01	-.5681E-01	.0000E+00	.28866E+01	-.2138E+01
.00000E+00	.1000E+01	.9450E-01	.0000E+00	.00000E+00	.00000E+00

B Matrix:

SYSTEM POLES

-1.4543992E-01 /+J(2.1886539E+00)
-1.4543992E-01 /+J(-2.1886539E+00)
-1.7037611E+00 /+J(0.0000000E+00)
3.0267972E-02 /+J(0.0000000E+00)

DYNAMICS

PERIOD= 2.8708 WD= 2.18865
ZETA= .06631 WN= 2.19348

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4
 1.9643602E+00 S3
 5.2465591E+00 S2
 8.0367079E+00 S1
 -2.4811554E-01 S0

NUMERATOR BETA/ AIL
 -2.6595488E-02 S3
 1.2240896E+00 S2
 1.2759304E+00 S1
 3.2043719E-01 S0

NUMERATOR P/ AIL
 4.4071304E+01 S3
 1.1135750E+01 S2
 2.0505864E+02 S1
 -1.1986246E+00 S0

NUMERATOR R/ AIL
 2.83664534E+00 S3
 2.2152538E+00 S2
 1.9372833E+01 S1
 1.2683084E+01 S0

NUMERATOR P/ RUD
 7.0225477E+00 S3
 -7.1511883E-01 S2
 1.4851434E+01 S1
 -8.7625086E-02 S0

NUMERATOR PHI/ AIL
 0.0000000E+00 S3
 4.4344070E+01 S2
 1.1345098E+01 S1
 2.0688943E+02 S0

NUMERATOR PHI/ RUD
 0.0000000E+00 S3
 6.8204994E+00 S2
 -1.1362219E+00 S1
 1.4953140E+01 S0

NUMERATOR AY/ RUD

-8.7625086E-02 S0

9.2720425E-01 S0

NUMERATOR AY/ AIL
 -1.3733667E+01 S4
 -2.8052490E+01 S3
 -1.6101221E+02 S2
 -2.0093750E+02 S1
 -1.9010422E+01 S0

NUMERATOR AY/ RUD
 1.5795595E+01 S4
 2.2478516E+01 S3
 -1.2646097E+02 S2
 -1.9193823E+02 S1
 -1.1075918E+00 S0

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AIRCRAFT STATE

MACH =	.70000	ALT =	20000.00	VTRFPS =	726.17
NZ =	.99946	ALPHA =	3.65152	BETA =	.00000
GAMMA =	.00000	THETA =	3.65153	ACGW =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IXZ =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.81643	FLAPS =	1.56063	STRAKES=	-3.98842
AILERON=	.00000	RUDDER =	.00000		
THRUST =	2178.077	Z RPM =	19.26140		

DYNAMICS

CXAERO =	-.01882118	CYAERO =	.00000000	CZAERO =	-.25705642
CLMAERO=	.00000000	CMMAERO=	.00420278	CNMMAERO=	.00000000
VC KTS =	323.811	DYN PR =	334.14453	RHO =	.00126733

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	*3071296	-5.1370735	1.6856546	.0000000
PITCH RATE(PER RAD)	*0000000	-7.2728968	-7.3926697	.0000000
STRAKE (PER RAD)	*0226788	-.2110947	-.2995498	.0000000
MACH (PER 1 #)	*0081028	-.0889266	.0235080	1067.0725098
ALPHA DOT (PER RAD)	*0000000	-.4740056	-.1184645	.0000000
CANARD (PER RAD)	-.0063362	-.2993854	.8918194	.0000000
FLAPERON (PER RAD)	*0358100	-1.5469923	-.5789520	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
ETA (PER RAD)	-1.0752907	.2294621	-.0507144
ROLL RATE (PER RAD)	*0000000	-.0145733	-.3756201
YAW RATE (PER RAD)	*0000000	-.1834183	.1569413
AILERON (PER RAD)	-.2179332	.0768455	.2052163
RUDDER (PER RAD)	*2449960	-.1434140	.0419127

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LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		² FT/SEC**2	² RAD/SEC**2	² RAD/SEC**2	² FT/SEC**2
ALPHA	(PER RAD)	-663.-6755371		15.1770391	37.9559479
ALPHADOT	(PER R/S)	-.2931610	-.0500152		.0000000
Q	(PER R/S)	-4.5164280	-.3543798		.0000000
VEL	(PER FT/S)	-.0426657	-.0010446		-.0067752
STRAKE	(PER RAD)	-.26.-3690796	-.2.7054768		2.832391
FLAPRN	(PER RAD)	-193.-2439880	-5.-2289829		4.4732342
CANARD	(PER RAD)	-.37.3979950	8.0547419		-.7914922

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-6.775E-02	-3796E+02	-.6625E+02	-.3211E+02	.2833E+01	-4473E+01	-.7915E+00
-.5885E-04	-.8878E+00	.9934E+00	-.2826E-02	-.3637E-01	-.2665E+00	-.5158E-01
-1.042E-02	-1.522E+02	-.4041E+00	.1414E-03	-.2704E+01	-.5216E+01	.8057E+01
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-4.5473042E+00	'+J (0.0000000E+00)
3.2580271E+00	'+J (0.0000000E+00)
-4.7118999E-03	'+J (6.2520385E-02)
-4.7113999E-03	'+J (-6.2520385E-02)

DYNAMICS

PERIOD=100.4982 WD= .06252
ZETA= .07515 WN= .06270

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4	NUMERATOR ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
1.2985822E+00 S3	-3.6371797E-02 S3	-2.7016572E+00 S3	0.0000000E+00 S3
-1.4799049E+01 S2	-2.7008314E+00 S2	-2.9753256E+00 S2	-2.7036572E+00 S2
-1.3458127E-01 S1	-1.9253116E-02 S1	-2.9772215E-02 S1	-2.9753256E+00 S1
-5.8279254E-02 S0	-3.8324371E-03 S0	5.2135792E-06 S0	-2.9772215E-02 S0
2.8329391E+00 S3	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
1.2731752E+02 S2	-2.6654822E-01 S3	-5.2156515E+00 S3	0.0000000E+00 S3
7.9113052E+01 S1	-5.2908230E+00 S2	-8.7279301E+00 S2	-5.2156515E+00 S2
9.5262604E+01 S0	-2.7141154E-02 S1	-6.8115532E-02 S1	-8.7279301E+00 S1
4.4732342E+00 S3	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
2.3687425E+02 S2	-8.2753203E-04 S0	9.7316015E-06 S0	-6.8115532E-02 S0
3.0249219E+02 S1	 	 	
2.7971069E+02 S0	 	 	
7.9149216E-01 S3	NUMERATOR ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
-3.7561377E+02 S2	-5.1584367E-02 S3	8.0573215E+00 S3	0.0000000E+00 S3
-2.3854962E+02 S1	7.9827232E+00 S2	6.4238691E+00 S2	-5.073215E+00 S2
-2.0538074E+02 S0	5.6569903E-02 S1	6.4623952E-02 S1	6.4233691E+00 S1
2.6358414E+01 S4	NUMERATOR AN/FLAP	NUMERATOR AN/CAN	NUMERATOR THT/CAN
-2.0478516E+00 S3	-1.9316585E+02 S4	-3.7382874E+01 S4	0.0000000E+00 S3
2.1367075E+03 S2	-5.4476318E+01 S3	-5.4058594E+01 S3	-5.4058594E+01 S3
1.2701723E+01 S1	6.2947227E+03 S2	-4.5978320E+03 S2	-4.5978320E+03 S2
-6.4783871E-02 S0	3.0878983E+01 S1	-2.1498489E+01 S1	-2.1498489E+01 S1

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y	L	N
		FT/SEC**2	RAD/SEC**2	RAD/SEC**2
BETA	(PER RAD)	-134.3208923	-16.0269318	6.7891464
P	(PER R/S)	.00000000	-2.6618896	-.1006219
R	(PER R/S)	.00000000	1.0575371	-.0732003
AILERON	(PEP RAD)	-27.2233276	77.9667969	5.1719599
RUDDER	(PER RAD)	30.6038971	13.8483038	-4.1099663

A Matrix:

BETA	P	R	PHI	AIL	RUD
-.1850E+00	.6369E-01	-.9980E+00	.4422E-01	-.3749E-01	.4214E-01
-.1603E+02	-.2642E+01	.1058E+01	.0000E+00	.7797E+02	.1385E+02
-.6789E+01	-.1006E+00	-.7320E-01	.0000E+00	.5172E+01	-.4110E+01
.0000E+00	.1000E+01	.6382E-01	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

$$\begin{aligned} & -1.7012846E-01 \quad /+J(\quad 2.7819939E+00) \\ & -1.7012846E-01 \quad /+J(\quad -2.7819939E+00) \\ & -2.5758400E+00 \quad /+J(\quad 0.0000000E+00) \\ & 1.6029797E-02 \quad /+J(\quad 0.0000000E+00) \end{aligned}$$

DYNAMICS

$$\begin{aligned} \text{PERIOD} &= 2.2585 & \text{WD} &= 2.78199 \\ \text{ZETA} &= .06104 & \text{WN} &= 2.78719 \end{aligned}$$

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA/ AIL	NUMERATOR P / AIL	NUMERATOR R / AIL	NUMERATOR PHI / AIL
-3.7489023E-02 S3	7.7966797E+01 S3	5.1719599E+00 S3	0.00000000E+00 S3
-2.9773617E-01 S2	2.6199219E+01 S2	6.5207291E+00 S2	7.8296844E+01 S2
-1.6441708E+00 S1	6.1281787E+02 S1	3.9334076E+01 S1	2.6615341E+01 S1
5.1051648E-01 S0	-1.7281036E+00 S0	2.7070175E+01 S0	6.1532813E+02 S0
NUMERATOR BETA/ RUD	NUMERATOR P / RUD	NUMERATOR R / RUD	NUMERATOR PHI / RUD
4.2144377E-02 S3	1.3848304E+01 S3	-4.1099663E+00 S3	0.0000000E+00 S3
5.0980120E+00 S2	-1.4466429E+00 S2	-1.2725623E+01 S2	1.3586018E+01 S2
1.2627754E+01 S1	2.7727554E+01 S1	3.5036480E-01 S1	-2.2587538E+00 S1
-1.8193901E-01 S0	-7.9489350E-02 S0	1.2446213E+00 S0	2.7749908E+01 S0
NUMERATOR AY/ AIL	NUMERATOR AY/ RUD	NUMERATOR AY / RUD	
-2.7168060E+01 S4	3.0541763E+01 S4	3.0541763E+01 S4	
-7.3471924E+01 S3	7.5577148E+01 S3	7.5577148E+01 S3	
-1.9165356E+02 S2	-4.4025220E+02 S2	-4.4025220E+02 S2	
-3.2084766E+02 S1	-1.0877554E+03 S1	-1.0877554E+03 S1	
-5.9860275E+01 S0	1.4632750E+01 S0	1.4632750E+01 S0	

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AIRCRAFT STATE

MACH = .90000	ALT = 20000.00	VTRFPS = 933.64
NZ = .99793	ALPHA = 3.23396	BETA = .00000
GAMMA = .00000	THETA = 3.23398	ACGW = 15926.00
IXX = 4548.00	IYY = 49429.00	IZZ = 52531.00
IYI = 1827.00	XCG = 450.56006	ZCG = 64.88000
GEAR DOWN:	NY = .00000	NX = .00000
NORMAL MODE:	DR MODE: F	AR MODE: F

CONTROLS

CANARDS= -3.58662	FLAPS = -2.28628	STRAKES= -2.35955
AILERON= .00000	RUDDER = -.00000	
THRUST = 3457.378	% RPM = 28.48160	

DYNAMICS

CXAERO = -.02503515	CYAERO = .00000000	CZAERC = -.15556610
CLMAERO= .00000000	CMMAERO= -.00403757	CNMAERO= .00000000
VC KTS = 423.744	DYN PR = 552.36182	RHO = .00126733

A/C CONSTANTS

AREA = 185.0490	CBAR = 7.2200	SPAN = 27.2000
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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CN	THRUST(LBS)
ALPHA (PER RAD)	.3094575	-.6.1562443	1.7845736	.0000000
PITCH RATE(PER RAD)	.0000000	-.8.0021572	-.8.8420544	.0000000
STRAKE (PER RAD)	.0062426	-.1809973	-.2213879	.0000000
MACH (PER M #)	-.0742142	-.2927207	-.0782672	788.9379983
ALPHA DOT (PER RAD)	.0000000	-.4486851	-1.2793741	.0000000
CANARD (PER RAD)	-.0091512	-.4128450	1.0362921	.0000000
FLAPERON (PER RAD)	.0309399	-.1.5183430	-.6590123	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.0620575	.2070553	-.0725927
ROLL RATE (PER RAD)	.0000000	-.0060346	-.4262069
YAW RATE (PER RAD)	.0000000	-.1580547	.1641418
AILERON (PER RAD)	-.2978523	.0513388	.1499838
RUDDER (PER RAD)	.2176202	-.1295732	.0405709

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		Z FT/SEC**2	M RAD/SEC**2	X FT/SEC**2
ALPHA	(PER RAD)	-1273.8625488	26.5066986	62.3384857
ALPHADOT	(PEP R/S)	-35710.06	-0.0736212	.0000000
Q	(PER R/S)	-6.3890972	-.5104374	.0000000
VEL	(PER FT/S)	-.0500675	-.0026188	-.0281302
STRAKE	(PER RAD)	-37.3748169	-.3.3053532	1.2890587
FLAPRN	(PER RAD)	-313.5283203	-9.8391466	6.33883988
CANARD	(PER RAD)	-85.2500305	15.4719772	-1.8896675

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-2813E-01	.62334E+02	-.5267E+02	-.3212E+02	.1289E+01	.6389E+01	-.1890E+01
-.5369E-04	-.1366E+01	*923E+00	-.1946E-02	-.4008E-01	-.3362E+00	-.9142E-01
-.2615E-02	.2661E+02	-.5835E+00	.1433E-03	-.3302E+01	-.9814E+01	.1548E+02
.0000E+00	.0000E+00	.0000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-6.1406317E+00	/+J(0.0000000E+00)
4.1964583E+00	/+J(0.0000000E+00)
-1.6768601E-02	/+J(7.6866567E-02)
-1.6768601E-02	/+J(-7.6866567E-02)

DYNAMICS

PERIOD=	81.7415	WD=	.07687
ZETA=	.21314	WN=	.07867

CHARACTERISTIC POLYNOMIAL

1.0000000E+00	S4	NUMERATOR ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
1.977706E+00	S3	-4.0079590E-02	S3	-3.3024025E+00
-2.5697342E+01	S2	-3.30958E+00	S2	-5.6739235E+00
-8.5262746E-01	S1	-9.3652129E-02	S1	-1.6784680E-01
-1.5944296E-01	S0	-2.1264625E-03	S0	-1.6784680E-01
1.2890587E+00	S3	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
1.7395123E+02	S2	-3.3621800E-01	S3	0.0000000E+00
1.6099756E+02	S1	-9.9493856E+00	S2	-9.8143940E+00
1.7963637E+02	S0	-2.5867540E-01	S1	-2.2645534E+01
6.3888988BE+00	S3	NUMERATOR ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
5.0841772E+02	S2	-9.1419458E-02	S3	0.0000000E+00
7.0929248E+02	S1	1.5310912E+01	S2	-9.8143940E+00
7.1955396E+02	S0	1.1931516E-02	S0	-1.5478707E+01
1.8896675E+00	S3	NUMERATOR AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN
-3.2464233E+02	S2	-3.1340820E+02	S4	-8.5217377E+01
-4.7976636E+32	S1	-1.2583203E+02	S3	-1.5641406E+02
-6.0305079E+02	S0	2.0850324E+04	S2	-1.7394543E+04
-3.7360504E+01	S4	5.6540381E+02	S1	-4.9563367E+02
-6.4624023E-01	S3	-1.2682629E+00	S0	1.1953287E+00
5.1957031E+03	S2	 	 	
1.4417918E+02	S1	 	 	
-3.3309013E-01	S0	 	 	

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D23 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	Z FT/SEC**2	X FT/SEC**2	L RAD/SEC**2	M RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-219.3083496			-40.5210724		9.5967598
P	(PER R/S)	.00000000			-3.8508730		-1.1395836
R	(PER R/S)	.00000000			1.4326839		-0.0720223
AILERON	(PER RAD)	-61.5046539		94.0917511		5.9895716	
RUDDER	(PER RAD)	44.9372101		22.3585815		-6.0303213	

A Matrix:

	P	R	PHI	AIL	RUD		
BETA							
83	-2349E+00	.5641E-01	-.9984E+00	.3441E-01	-.6588E-01	.4813E-01	.0000E+00
	-4052E+02	-.3851E+01	.1433E+01	.0000E+00	.9409E+02	.2236E+02	.0000E+00
	.9597E+01	-.1386E+00	-.7202E-01	.0000E+00	.5990E+01	-.6080E+01	.0000E+00
	.0000E+00	.1000E+01	.5650E-01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

3 Matrix:

	P	R	PHI	AIL	RUD	
BETA						
83	-2.1961498E-01	/+J (3.4091587E+00)				
	-2.1961499E-01	/+J (-3.4091587E+00)				
	-3.7289696E+00	/+J (0.0000000E+00)				
	1.0464229E-02	/+J (0.0000000E+00)				

SYSTEM POLES

-2.1961498E-01	/+J (3.4091587E+00)
-2.1961499E-01	/+J (-3.4091587E+00)
-3.7289696E+00	/+J (0.0000000E+00)
1.0464229E-02	/+J (0.0000000E+00)

DYNAMICS

PERIOD= 1.8430 WD= 3.40916
ZETA= .06429 WN= 3.41623

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4	NUMERATOR P/ AIL	NUMERATOR R/ AIL	NUMERATOR PHI/ AIL
4.1577892E+00 S3	9.4091751E+01 S3	5.9695716E+00 S3	0.0000000E+00 S3
1.3264754E+01 S2	4.0128799E+01 S2	1.0800224E+01 S2	9.4430170E+01 S2
4.3379944E+01 S1	1.1467493E+03 S1	6.4181763E+01 S1	4.0739044E+01 S1
-4.5542973E-01 S0	-2.2291775E+00 S0	3.9417877E+01 S0	1.1503757E+03 S0
NUMERATOR BETA/ AIL	NUMERATOR P/ RUD	NUMERATOR R/ RUD	NUMERATOR PHI/ RUD
-6.5875888E-02 S3	2.2358582E+01 S3	-6.0803213E+00 S3	0.0000000E+00 S3
-9.3045735E-01 S2	-3.7992849E+00 S2	-2.7479416E+01 S2	2.2015015E+01 S2
-5.9255648E+00 S1	-3.2907181E+01 S1	-5.9733315E+00 S1	-5.3519545E+00 S1
5.4789352E-01 S0	6.1635610E-02 S0	-1.0944576E+00 S0	-3.3244690E+01 S0
NUMERATOR BETA/ RUD	NUMERATOR AY/ AIL	NUMERATOR AY/ RUD	NUMERATOR PHI/ RUD
4.8130952E-02 S3	-6.1406738E+01 S4	4.4865646E+01 S4	0.0000000E+00 S3
7.5207663E+00 S2	-2.3989063E+02 S3	1.6510229E+02 S3	2.2015015E+01 S2
2.6850616E+01 S1	-6.0297900E+02 S2	-1.0932170E+03 S2	-5.3519545E+00 S1
-2.9586720E-01 S0	4.4457291E+01 S0	-3.9387527E+03 S1	-3.3244690E+01 S0

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AIRCRAFT STATE

W4CH =	1.10000	ALT =	20000.00	VTRFPS =	1141.12
NZ =	.99796	ALPHA =	2.69010	BETA =	.000000
GAMMA =	-00000	THETA =	2.69012	ACGW =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYX =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.000000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.74969	FLAPS =	-2.59503	STRAKES=	-5.43995
AILERONE=	.00000	RUDDER =	.00000		
THRUST =	9265.582	% RPM =	70.44980		

DYNAMICS

CXAERO =	-.0557871	CYAERO =	.00000003	CZAERO =	-.10421002
CLMAERO=	.00000000	CMMAERO=	.00726094	CNMAERO=	.00000000
VC KTS =	527.733	DYN PR =	825.13257	RHO =	.00126733

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	.2548127	-6.6815357	.8093599	.0000000
PITCH RATE (PER RAD)	.0000000	-7.0114584	-9.1286259	.0000000
STRAKE (PER RAD)	.0065848	-.1366521	-.2426434	.0000000
MACH (PER M #)	-.0420622	.1669449	.0470548	3233.0952051
ALPHA DOT (PER RAD)	.0000000	-.4069776	-.1.5346003	.0000000
CANARD (PER RAD)	-.0179036	-.6994841	.8232118	.0000000
FLAPERON (PER RAD)	.0278860	-.7601295	-.5701944	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.1401815	.2041374	-.0795999
ROLL RATE (PER RAD)	.0000000	.0676604	-.5329912
YAW RATE (PER RAD)	.0000000	-.3941029	.2338768
AILERON (PER RAD)	-.3550310	.0766411	.0886888
RUDDER (PER RAD)	.1091133	-.0721265	.0217854

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U01

MODELS ENCORE COMPUTER CORP. MPX-32 3.5

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z	M	X
	FT/SEC**2	RAD/SEC**2	FT/SEC**2
ALPHA (PER RAD)	-2056.8457031	18.0807495	76.1452789
ALPHADOT (PER R/S)	-3962740	-1080381	.0000000
Q (PER R/S)	-6.8421249	-6440882	.0000000
VEL (PER FT/S)	.0780774	.0004974	.0395579
STRAKE (PER RAD)	-42.1525421	-5.4116945	2.0311737
FLAPRN (PER RAD)	-234.4741821	-12.7170849	8.6018715
CANARD (PER RAD)	-215.7671204	18.3601532	-5.5226517

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-3956E-01	.7615E+02	-.5356E+02	-.3214E+02	.2031E+01	-.8602E+01	-.5523E+01
.6847E-04	-.1804E+01	.9937E+00	-.1324E-02	-.3697E-01	-.2056E+00	-.1892E+00
.4900E-03	.1828E+02	-.7514E+00	.1431E-03	-.5408E+01	-.1269E+02	.1838E+02
.00000E+00	.00000E+00	.10000E+01	.00000E+00	.00000E+00	.00000E+00	.00000E+00

B Matrix:

SYSTEM POLES

3.0085392E+00	/+J (0.00000000E+00)
-5.571107E+00	/+J (0.00000000E+00)
-8.2584739E-02	/+J (0.00000000E+00)
5.0300807E-02	/+J (0.00000000E+00)

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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CHARACTERISTIC POLYNOMIAL

NUMERATOR U/STRK	ALP/STRK	Q/STRK	NUMERATOR THT/STRK
1.000000E+00 S4	-5.4077005E+00 S3	0.000000DE+00 S3	
2.5946362E+00 S3	-1.0643142E+01 S2	-5.4077005E+00 S2	
-1.6682190E+01 S2	-3.8140793E-01 S1	-1.0643142E+01 S1	
-5.5167902E-01 S1	3.3793433E-05 S0	-3.8140798E-01 S0	
6.9664717E-02 S0			
NUMERATOR U/FLAP	ALP/FLAP	Q/FLAP	NUMERATOR THT/FLAP
8.6018715E+00 S3	-2.0563221E-01 S3	-1.2694859E+01 S3	0.000000E+00 S3
6.8622070E+02 S2	-1.2776352E+01 S2	-2.7155518E+01 S2	-1.2694869E+01 S2
7.1835864E+02 S1	-4.4246387E-01 S1	-9.7754383E-01 S1	-2.7155513E+01 S1
8.5821899E+02 S0	2.5422353E-02 S0	9.0195914E-05 S0	-9.7754383E-01 S0
NUMERATOR U/CAN	ALP/CAN	Q/CAN	NUMERATOR THT/CAN
-5.5226517E+00 S3	-1.8922627E-01 S3	1.8380600E+01 S3	0.000000E+00 S3
-1.0129297E+03 S2	1.8113861E+01 S2	3.0421768E+01 S2	1.8380600E+01 S2
-7.0853906E+02 S1	6.1718333E-01 S1	1.0599604E+00 S1	3.0421768E+01 S1
-9.5640918E+02 S0	-6.478212E-02 S0	-8.6041662E-05 S0	1.0599604E+00 S0
NUMERATOR AN/STRK	AN/FLAP	AN/CAN	
-4.21377909E+01 S4	-2.3439276E+02 S4	-2.1569221E+02 S4	
5.9531250E+00 S3	-9.2878906E+01 S3	-3.0404297E+02 S3	
1.1910949E+04 S2	3.0430082E+04 S2	-3.3945422E+04 S2	
4.3193506E+02 S1	1.1022393E+03 S1	-1.2129717E+03 S1	
-6.1446208E-01 S0	-1.5789433E+00 S0	1.6986609E+00 S0	

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LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-351.7072754	-67.1439056	13.8040886
P	(PER R/S)	.0000000	-5.8569746	-.139490
R	(PER R/S)	.0000000	2.4301519	.2863269
AILERON	(PER RAD)	-109.5149994	84.6052399	9.0018473
RUDDER	(PER RAD)	33.6577301	17.8527527	-5.0814829

A Matrix:

BETA	P	Q	PHI	AIL	RUD
-3082E+00	-4693E-01	-9989E+00	.2816E-01	-9597E-01	.2950E-01
-6714E+02	-5857E+01	-2430E+01	.0000E+00	.8461E+02	.0000E+00
-1380E+02	-1399E+00	-2868E+00	.0000E+00	-9002E+01	.0000E+00
.0000E+00	-1000E+01	.4699E-01	.0000E+00	.0000E+00	.0000E+00

S Matrix:

SYSTEM POLES

-4.05589595E-01	/+J(	4.0180931E+00)
-4.05589938E-01	/+J(	-4.0180931E+00)
-5.6464739E+00	/+J(	0.0000000E+00)
5.6662001E-03	/+J(0.0000000E+00)

DYNAMICS

PERIOD= 1.5637 WD= 4.01809
ZETA= .10043 WN= 4.03351

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TASK # 080000005 MODELS ENCORE COMPUTER CORP. MPX-72 3.5 U01 MPX-D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4

6.4520130E+00 S3

2.0853806E+01 S2

9.1972260E+01 S1

-5.2186096E-01 S0

NUMERATOR BETA/ AIL

-9.5971406E-02 S3

-5.6107264E+00 S2

-3.6471603E+01 S1

1.3536968E+00 S0

NUMERATOR P/ AIL

3.4605240E+01 S3

7.8663116E+01 S2

1.7832146E+03 S1

-2.3459644E+00 S0

NUMERATOR PHI/ AIL

9.0013473E+00 S3

4.2332840E+01 S2

8.7120773E+01 S1

4.9915405E+01 S0

NUMERATOR R/ AIL

0.0000000E+00 S3

8.5028183E+01 S2

8.0652130E+01 S1

1.7873079E+03 S0

NUMERATOR PHI/ FUD

0.0000000E+00 S3

1.7613983E+01 S2

-5.2763562E+00 S1

-9.7002701E+01 S0

NUMERATOR R/ RUD

-5.0814829E+00 S3

-3.3419617E+01 S2

-1.1728155E+01 S1

-2.6684589E+00 S0

NUMERATOR AY/ AIL

3.3620636E+01 S4

1.9912256E+02 S3

-1.4825732E+03 S2

-8.3140117E+03 S1

6.9124222E+01 S0

NUMERATOR AY/ RUD

/

NUMERATOR /

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TASK # 03000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPPX.D23 PAGE 1

AIRCRAFT STATE

MACH =	1.20000	ALT =	20000.00	VTRFPS =	1244.86
NZ =	.99853	ALPHA =	2.58764	BETA =	.00000
SAMMA =	.00000	THETA =	2.58765	ACGW =	15926.03
I _X X =	4548.00	IYY =	49429.00	IZZ =	52531.00
I _X Z =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.26038	FLAPS =	-1.09730	STRAKES=	-7.00000
AILERON=	.00000	RUDDER =	.00000		
THRUST =	11813.973	% RPM =	87.10735		

DYNAMICS

CXAERO =	.00000000	CZAERO =	-.38756304		
CLMAERO=	.00000000	CMMAERO=	.00000000		
VC KTS =	579.107	DYN PR =	981.97510	RHO =	.00126733

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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MODELS ENCORE COMPUTE CORP. MPX-32 3.5 U01

MPX.D23

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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CL BODY	CN
ALPHA (PER RAD)	.2187977	-6.3249683	.5628051
PITCH RATE (PER RAD)	.0000000	-6.1532333	-.5496159
STRAKE (PER RAD)	.0110895	-.1250732	-.2317507
MACH (PER M #)	-.0431444	.1197350	-.0851833
ALPHA DOT (PER RAD)	.0000000	-.3862703	-.5186577
CANARD (PER RAD)	-.0163906	-.5097920	.6997794
FLAPERON (PER RAD)	.0263562	-.5748703	-.5274719

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CL	CN
BETA (PER RAD)	-1.1646433	.2105690	-.0883488
ROLL RATE (PER RAD)	.0000000	.0704445	-.5611741
YAW RATE (PER RAD)	.0000000	-.4563156	.2216032
AILERON (PER RAD)	-.3384541	.0977540	.0604245
RUDDER (PER RAD)	.0729126	-.0509129	.0144149

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MODELS ENCORE COMPUTER CORP. MPX-12 3.5 U01

MPX.D23

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LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z	M	X
	FT/SEC**2	RAD/SEC**2	FT/SEC**2
ALPHA (PER RAD)	-2317.6823730	14.8040037	77.2769775
ALPHADOT (PER R/S)	-.4103707	-.1166546	.0000000
Q (PER R/S)	-.5505037	-.6580738	.0000000
VEL (PER FT/S)	.0749447	-.0024580	-.0460699
STRAKE (PER RAD)	-.45.9143219	-.6.1512319	4.0709496
FLAPRN (PER RAD)	-211.0346527	-14.0003929	9.6753521
CANARD (PER RAD)	-187.1444397	18.5742798	-6.0169821

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-4.607E-01	.7728E+02	-.5620E+02	-.3214E+02	.4071E+01	.9675E+01	-.6017E+01
.6024E-04	-.1863E+01	.9944E+00	-.1168E-02	-.3691E-01	-.1696E+00	-.1504E+00
-.2465E-02	.1502E+02	-.7741E+00	.1362E-03	-.6147E+01	-.1398E+02	.1859E+02
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-5.2386503E+00	/+J (0.0200000E+00)
2.6086397E+00	/+J (0.0000000E+00)
-2.6627243E-02	/+J (8.9001060E-02)
-2.6627243E-02	/+J (-8.9001060E-02)

DYNAMICS

PERIOD= 70.5968 WD= .03900
ZETA= .28663 WN= .09290

CHARACTERISTIC POLYNOMIAL

1.000000E+00 S4	NUMERATOR ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
2.-6932342E+00 S3	-3.-6903619E-02 S3	-6.-1469259E+00 S3	0.000000E+00 S3
-1.3516954E+01 S2	-6.-1425571E+00 S2	-1.-2299903E+01 S2	-6.-1469259E+00 S2
-7.-0509624E-01 S1	-2.-5960004E-01 S1	-5.-3250802E-01 S1	-1.-2299908E+01 S1
-1.-1794496E-01 S0	1.-5171483E-02 S0	1.-2370465E-06 S0	-5.-3250802E-01 S0
9.6753521E+00 S3	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
7.9814258E+02 S2	-1.-6964197E-01 S3	-1.-3980603E+01 S3	0.-3980603E+00 S3
8.-4141431E+02 S1	-1.-4040924E+01 S2	-2.-9263290E+01 S2	-1.-3980603E+01 S2
9.-2051880E+02 S0	-5.-8260912E-01 S1	-1.-2556553E+00 S1	-2.-9263290E+01 S1
	4.-1297406E-02 S0	3.-2566085E-06 S0	-1.-2556553E+00 S0
-6.-0169321E+00 S3	NUMERATOR ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
-1.-0723396E+03 S2	-1.-5043765E+01 S3	1.-8591827E+01 S3	0.-3249786E+00 S3
-9.-1541138E+02 S1	1.-8364044E+01 S2	3.-3249786E+01 S2	1.-5591827E+01 S2
-1.-0424614E+03 S0	7.-9703683E-01 S1	1.-4559526E+00 S1	3.-3249786E+01 S1
	-2.-5104310E-02 S0	-2.-3512675E-06 S0	1.-4559526E+00 S0
-4.-5399135E+01 S4	NUMERATOR AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN
5.-4335938E+00 S3	-2.-1096503E+02 S4	-1.-3708273E+02 S4	-1.-3708273E+02 S4
1.-4964273E+04 S2	-7.-5015625E+01 S3	-2.-3326953E+02 S3	-2.-3326953E+02 S3
6.-6322241E+02 S1	3.-5646695E+04 S2	-4.-3330906E+04 S2	-4.-3330906E+04 S2
-7.-7504158E-01 S0	1.-5703704E+03 S1	-1.-7935298E+03 S1	-1.-7935298E+03 S1
	-1.-8279848E+00 S0	2.-1177912E+00 S0	2.-1177912E+00 S0

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		^Y	^L	^N
		FT/SEC**2	RAD/SEC**2	RAD/SEC**2
BETA	(PER RAD)	-427.5400391	-89.3029022	16.7063446
P	(PER R/S)	.0000000	-6.7276125	-.1615717
R	(PER R/S)	.0000000	2.4772358	-.3828979
AILERON	(PER RAD)	-124.2463684	70.3446198	11.6441364
RUDDER	(PER RAD)	26.7661896	13.9359350	-4.3056631

A Matrix:

BETA	P	R	PHI	AIL	RUD
-3634E+00	-4515E-01	-9990E+00	.2582E-01	-.9981E-01	.2150E-01
-8930E+02	-.6728E+01	.2477E+01	.00000E+00	.7034E+02	.1394E+02
1671E+02	-.1616E+00	-.3829E+00	.00000E+00	.1164E+02	-.4306E+01
.00000E+00	.10000E+01	.4519E-01	.00000E+00	.00000E+00	.00000E+00

B Matrix:

SYSTEM POLES

-4.7717381E-01	/+J (	4.4414616E+00)
-4.7717381E-01	/+J (	-4.4414616E+00)
-6.5022373E+00	/+J (	0.0000000E+00)
2.5716668E-03	/+J (	0.0000000E+00)

DYNAMICS

PERIOD= 1.4147 WD= 4.44146
 ZETA= .10632 WN= 4.46702

CHARACTERISTIC POLYNOMIAL

1.000000E+00 S4
 7.4539547E+00 S3
 2.6139389E+01 S2
 1.2967703E+02 S1
 -3.3369493E-01 S0

NUMERATOR BETA/ AIL
 7.0344620E+01 S3
 8.8852666E+01 S2
 2.2312373E+03 S1
 -2.5842133E+00 S0

NUMERATOR P/ AIL
 1.1644136E+01 S3
 6.9303223E+01 S2
 1.1034673E+02 S1
 5.7190796E+01 S0

NUMERATOR P/ RUD
 1.3935935E+01 S3
 -2.4640217E+00 S2
 -1.5321103E+02 S1
 1.7725409E-01 S0

/

NUMERATOR AY/ AIL
 2.6738892E+01 S4
 1.8386743E+02 S3
 -1.5135056E+03 S2
 -9.9385234E+03 S1
 6.5510635E+01 S0

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TASK # 03000000

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 1

AIRCRAFT STATE

MACH = .50000	ALT = 30000.00	VTRFPS = 497.64
NZ = .99307	ALPHA = 6.98570	BETA = .00000
GAMMA = .00000	THETA = 6.98573	ACGW = 15926.00
IYX = 4548.00	IYY = 49429.00	IIZ = 52531.00
IY2 = 1827.00	XCG = 450.56006	ZCG = 64.88000
GEAR DOWN:	NY = .00000	NX = .00000
NORMAL MODE: T	DP MODE: F	AR MODE: F

CONTROLS

CANARD:= -3.77137	FLAPS = 13.40220	STRAKES= -8.57309
AILERON= .00000	RUDDER = .00000	
THRUST = 1896.780	% RPM = 27.33110	

DYNAMICS

CAERO = .00000000	CZAERO = -.77448088
CMMAERO= .00000000	CNMAERO= .00000000
VC KTS = 184.311	CYN PR = 110.29778
AREA = 185.0490	CBAR = 7.2200
	SPAN = 27.2000

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U91 MPX.D23 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CY	THRUST(LBS)
ALPHA (PER RAD)	.4509326	-4.9901967	1.7415771	.0000000
PITCH RATE(PER RAD)	.0000000	-6.7815428	-7.4643784	.0000000
STRAKE (PER RAD)	.0368900	-.2201020	-.3320416	.0000000
MACH (PER M #)	-.0280953	-.996858	.0370250	918.3127441
ALPHA DOT (PER RAD)	.0000000	-.4773679	~1.0246754	.0000000
CANARD (PER RAD)	-.0901213	-.2340493	.8462499	.0000000
FLAPERON (PER RAD)	.0381007	-1.4610431	-.5628n56	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.1382305	.2977938	-.0394745
ROLL RATE (PER RAD)	.0000000	-.0395152	-.3367432
YAW RATE (PER RAD)	.0000000	-.2018352	.2115317
AILERON (PER RAD)	-.215351	.0800961	.2309904
RUDDER (PER RAD)	.25772526	-.1511177	.0433351

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TASK = 0300000 MODELS ENCODE COMPUTED COORD. WDX-32 3.5 J01 YPX.D23 PAGE 3

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		^Z FT/SEC**2	^X RAD/SEC**2	^Z FT/SEC**2	^X FT/SEC**2
ALPHA	(PER RAD)	-206.6115570	5.1300097	18.2681732	
ALPHADOT	(PER R/S)	-1406762	-0.0218329	0.0000000	
Q	(PER R/S)	-2.0284662	-1.614320	0.0000000	
VEL	(PER FT/S)	-0.0822117	-0.0010433	-0.0035116	
STRAKE	(PER RAD)	-9.0755711	-9.699187	1.5211029	
FLAPRN	(PER RAD)	-60.2440948	-1.6779003	1.5710220	
CANARD	(PER RAD)	-9.6506662	2.5229330	-3.7160139	

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-3512E-02	-1827E+02	-6052E+02	-3194E+02	1521E+01	1571E+01	-3716E+01
-1664E-03	-4182E+00	.9956E+00	-7920E-02	-1837E-01	-1219E+00	-1953E-01
-1040E-02	.5139E+01	-1.832E+00	.1729E-03	-.9895E+00	-.1675E+01	.2523E+01
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

$$\begin{aligned} & 1.9854965E+00 \quad /+J(\quad 0.0000000E+00) \\ & -2.5759525E+00 \quad /+J(\quad 0.0000000E+00) \\ & -7.2013699E-03 \quad /+J(\quad 8.94734886E-02) \\ & -7.2013699E-03 \quad /+J(\quad -8.94734886E-02) \end{aligned}$$

DYNAMICS

$$\begin{aligned} \text{PERIOD} &= 70.2240 & \omega_0 &= .08947 \\ \text{ZETA} &= .08023 & \omega_n &= .08976 \end{aligned}$$

CHARACTERISTIC POLYNOMIAL

NUMERATOR U/STRK	ALP/STRK	Q/STRK	NUMERATOR THT/STRK
1.000000E+00 S4	-9.8951769E-01 S3	-9.8951769E-01 S3	0.0000000E+00 S3
6.0484684E-01 S3	-5.1323622E-01 S2	-5.1323622E-01 S2	-9.8951769E-01 S2
-5.0979300E+00 S2	-6.4046383E-03 S1	-6.4046383E-03 S1	-5.1323622E-01 S1
-6.8874717E-02 S1	-1.3661401E-07 S0	-1.3661401E-07 S0	-6.4046383E-03 S0
-4.1198127E-02 S0			
NUMERATOR U/FLAP	ALP/FLAP	Q/FLAP	NUMERATOR THT/FLAP
1.5710220E+00 S3	-1.2192947E-01 S3	-1.6752386E+00 S3	0.0000000E+00 S3
1.0010912E+02 S2	-1.6909075E+00 S2	-1.3346577E+00 S2	-1.6752386E+00 S2
9.5027222E+01 S1	-3.5190226E-03 S1	-9.4617195E-03 S1	-1.3346577E+00 S1
4.2688934E+01 S0	-4.7923322E-03 S0	-6.1722756E-07 S0	-9.4617195E-03 S0
NUMERATOR U/CAN	ALP/CAN	Q/CAN	NUMERATOR THT/CAN
-3.7160139E+00 S3	-1.9532219E-02 S3	2.5233593E+00 S3	0.0000000E+00 S3
-1.5531474E+02 S2	2.5092525E+00 S2	9.6752918E-01 S2	2.5233593E+00 S2
-7.3813583E+01 S1	1.9429307E-02 S1	1.6165056E-02 S1	9.6752918E-01 S1
-3.1007690E+01 S0	1.39533928E-02 S0	-6.5585311E-08 S0	1.6185056E-02 S0
NUMERATOR AN/STRK	AN/FLAP	AN/CAN	NUMERATOR THT/FLAP
-9.0729885E+00 S4	-6.0226929E+01 S4	-9.6479197E+00 S4	-9.6479197E+00 S4
3.2714844E-01 S3	-7.7395020E+00 S3	-6.9680176E+00 S3	-6.9680176E+00 S3
2.46664641E+02 S2	6.5095923E+02 S2	-4.5843896E+02 S2	-4.5843896E+02 S2
-1.1204720E+00 S1	-2.9161186E+00 S1	2.6839104E+00 S1	2.6839104E+00 S1
-2.5129035E-02 S0	-3.7326888E-02 S0	6.3365042E-02 S0	6.3365042E-02 S0

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM
BODY-AXIS STABILITY DERIVATIVES

	Y	L	N
	FT/SEC**2	RAD/SEC**2	RAD/SEC**2
BETA	(PER RAD)	-46.9331818	-3.6046562
P	(PER R/S)	.000000000	-1.1439295
R	(PER R/S)	.000000000	.6919118
AILERON	(PER RAD)	-8.8797045	28.9404449
RUDDER	(PER RAD)	10.6074209	4.7141190

A Matrix:

BETA	P	R	PHI	AIL	RUD
-9431E-01	-1216E+00	-9926E+00	-6417E-01	-1784E-01	2132E-01
-3605E+01	-1144E+01	.6919E+00	.0000E+00	.2894E+02	.4714E+01
-3022E+01	-5120E-01	-.3423E-01	.0000E+00	.1852E+01	.1433E+01
.0000E+00	.1000E+01	.1225E+00	.0000E+00	.0000E+00	.0000E+00

3 Matrix:

POLES***

-1.1205655E-01	r+j (1.8496208E+00)
-1.1205655E-01	r+j (-1.8496208E+00)
-1.0897570E+00	r+j (0.0000000E+00)
4.1394312E-02	r+j (0.0000000E+00)

DYNAMICS***

PERIOD= 3.3970 WD= 1.34962
ZETA= .06047 WN= 1.85301

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TASK # 03000000

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA/ AIL	NUMERATOR P / AIL	NUMERATOR R / AIL	NUMERATOR PHI/ AIL
-1.7843522E-02 S3	2.8940445E+01 S3	1.8520613E+00 S3	0.0000000E+00 S3
1.6604280E+00 S2	5.0657883E+00 S2	7.5767797E-01 S2	2.9167374E+01 S2
1.5145521E+00 S1	9.3608902E+01 S1	1.1443089E+01 S1	5.1586266E+00 S1
1.5081313E-01 S0	-7.4018013E-01 S0	6.0404825E+00 S0	9.5011032E+01 S0
NUMERATOR BETA/ RUD	NUMERATOR P / RUD	NUMERATOR R / RUD	NUMERATOR PHI/ RUD
2.1315321E-02 S3	4.-7141190E+00 S3	-1.4331026E+00 S3	0.0000000E+00 S3
2.0209122E+00 S2	-4.-6246195E-01 S2	-1.-9514694E+00 S2	4.-5395199E+00 S2
2.0586271E+00 S1	8.-9755535E+00 S1	7.044775E+00 S1	-7.-0157653E-01 S1
-6.-8067074E-02 S0	-7.-1394503E-02 S0	5.8264428E-01 S0	9.-0986328E+00 S0
NUMERATOR AY/ AIL	NUMERATOR AY/ RUD	NUMERATOR /	
-8.8137894E+00 S4	1.-0528681E+01 S4		
-1.-6595703E+01 S3	5.-0314941E+00 S3		
-1.-1569971E+02 S2	-6.-4017853E+01 S2		
-1.-0351172E+02 S1	-5.-8291016E+01 S1		
-5.-7039185E+00 S0	1.-5515366E+00 S0		

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AIRCRAFT STATE

MACH =	.70000	ALT =	30000.00	VTRFPS =	696.70
NZ =	.99816	ALPHA =	4.42325	BETA =	.000000
GAMMA =	.00000	THETA =	4.42327	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYI =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.000000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-3.02314	FLAPS =	4.89607	STRAKES=	-6.07558
AILERON=	-0.00000	RUDDER =	.00000		
THRUST =	1846.918	X RPM =	23.94859		

DYNAMICS

CAERO =	.0000000	CZAERO =	-.39693648
CLMAERO=	.00000000	CNMAERO=	.00000000
VC KTS =	263.097	DYN PR =	216.18355
AREA =	185.0490		

A/C CONSTANTS

CBAR =	7.2200	SPAN =	27.2000
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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(L9S)
ALPHA (PER RAD)	-3493705	-5.1572371	1.7070637	.0000000
DITCH RATE(PER RAD)	.0000000	-7.2730341	-7.8922453	.0000000
STRAKE (PER RAD)	.0229956	-.2107804	-.3283005	.0000000
MACH (PER M #)	.0047504	-.1388484	.01888657	1044.1550293
ALPHA DOT (PER RAD)	.0000000	-.4738842	-1.1184721	.0000000
CANARD (PER RAD)	-.0196563	-.2862219	.8894115	.0000000
FLAPERON (PER RAD)	.0358101	-1.5469913	-.5789517	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
ZETA (PER RAD)	-1.1047325	.2481541	-.0427122
ROLL RATE (PER RAD)	.0000000	-.0224129	-.3665565
YAW RATE (PER RAD)	.0000000	-.1851723	.1751904
AILERON (PER RAD)	-.2181808	.0766279	.2116327
RUDDER (PER RAD)	.2568131	-.1514564	.0444041

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5

U01 MPX.D23

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LONGITUDINAL SYSTEM
BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		$\frac{^2}{FT/SEC} \times 10^2$	$\frac{M}{RAD/SEC} \times 10^2$	$\frac{X}{FT/SEC} \times 10^2$
ALPHA	(PER RAD)	-419.8540039	9.9265556	27.8958130
ALPHADOT	(PER R/S)	-1972643	-0.0336635	-0.0000000
Q	(PER R/S)	-3.0456676	-0.2389598	-0.0000000
VEL	(PER FT/S)	-0.0569184	-0.0009199	-0.0041988
STRAKE	(PER RAD)	-17.0347595	-1.9183798	1.8584509
FLAPRN	(PER RAD)	-125.0240021	-3.3830261	2.8940830
CANARD	(PER RAD)	-23.1317596	5.1971560	-1.5685735

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-4.199E-02	.2790E+02	-.5373E+02	-.3208E+02	.1858E+01	.2894E+01	-.1589E+01
-.81192E-04	-.6043E+00	.9953E+00	-.3571E-02	-.2452E-01	-.1799E+00	-.3329E-01
-.9171E-03	.9947E+01	-.2725E+00	.1202E-03	-.1918E+01	-.3377E+01	.5198E+01
.0000E+00	.0000E+00	.0000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

$$\begin{aligned} & -3.5954370E+00 \quad ,+J(\quad 0.0000000E+00) \\ & 2.7233095E+00 \quad ,+J(\quad 0.0000000E+00) \\ & -4.4075027E-03 \quad ,+J(\quad 6.6805065E-02) \\ & -4.4075027E-03 \quad ,+J(\quad -6.6805065E-02) \end{aligned}$$

DYNAMICS

$$\begin{aligned} \text{PERIOD} &= 94.0525 & WD &= .06681 \\ \text{ZETA} &= .06583 & WN &= .06695 \end{aligned}$$

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4

8.8092566E-01 S3

-9.7792645E+00 S2

-8.2319975E-02 S1

-4.3853033E-02 S0

NUMERATOR U/STRK

1.8584509E+00 S3

1.0397913E+02 S2

6.5351959E+01 S1

4.5248718E+01 S0

NUMERATOR ALP/STRK

-2.4516709E-02 S3

-1.9155407E+00 S2

-1.0160878E-02 S1

-4.2810515E-03 S0

NUMERATOR THT/STRK

-1.9175549E+00 S3

-1.4123249E+00 S2

-1.2186185E-02 S1

5.2385496E-07 S0

NUMERATOR Q/STRK

-1.9175549E+00 S3

-1.4123249E+00 S2

-1.2186185E-02 S1

-1.2186185E-02 S0

NUMERATOR THT/FLAP

0.0000000E+00 S3

-3.3769684E+00 S2

-3.8472137E+00 S1

-2.3155238E-02 S0

NUMERATOR Q/FLAP

-3.3769684E+00 S3

-3.8472137E+00 S2

-2.3155238E-02 S1

-2.3155238E-02 S0

NUMERATOR AN/CAN

-1.7993659E-01 S3

-3.4112272E+00 S2

-1.0940619E-02 S1

-3.5171481E-03 S0

NUMERATOR ALP/CAN

-3.3291612E-02 S3

5.1649342E+00 S2

2.9132813E-02 S1

1.4551431E-02 S0

NUMERATOR AN/FLAP

-1.2498849E+02 S4

-2.3797119E+01 S3

2.6563928E+03 S2

4.097742E+00 S1

-5.8959149E-02 S0

NUMERATOR THT/CAN

0.0000000E+00 S3

5.1982765E+00 S2

2.8332491E+00 S1

-5.1193530E-07 S0

NUMERATOR AN/CAN

-2.3125198E+01 S4

-2.3160400E+01 S3

-1.9349111E+03 S2

-1.4076309E+00 S1

6.6605389E-02 S0

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TASK # 080000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-89.2818604	-8.2696390	4.8526182
P	(PER R/S)	.00000000	-1.7398958	-.0695753
R	(PER R/S)	.00000000	.7992898	-.0470750
AILERON	(PER RAD)	-17.6328583	51.9977722	3.3957148
RUDDER	(PER RAD)	20.7550354	9.4961958	-2.8069754

A Matrix:

BETA	P	R	PHI	AIL	RUD
-1281E+00	.7712E-01	-.9970E+00	.4604E-01	-.2531E-01	.2979E-01
-.8270E+01	-.1740E+01	.7993E+00	.0000E+00	.5200E+02	.9496E+01
-.4853E+01	-.6958E-01	-.4707E-01	.0000E+00	.3396E+01	-.2807E+01
.0000E+00	.1000E+01	.7733E-01	.0000E+00	.0000E+00	.0000E+00

E Matrix:

SYSTEM POLES

-1.2383652E-01	/+J(2.3344107E+00)
-1.2383652E-01	/+J(-2.3344107E+00)
-1.6883583E+00	/+J(0.0000000E+00)
2.0894349E-02	/+J(0.0000000E+00)

DYNAMICS

PERIOD= 2.6916 WD= 2.33441
ZETA= .05297 WN= 2.33769

CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA / AIL	NUMERATOR P / AIL	NUMERATOR R / AIL	NUMERATOR PHI / AIL
1.0000000E+00 S4 1.9151201E+00 S3 5.8424635E+00 S2 9.1035395E+00 S1 -1.92778216E-01 S0	5.1997772E+01 S3 1-2034730E+01 S2 2.8014453E+02 S1 -9.9877137E-01 S0	3.3957148E+00 S3 2.6027746E+00 S2 2.1691162E+01 S1 1.2910760E+01 S0	0.0000000E+00 S3 5-2260437E+01 S2 1-2236065E+01 S1 2.8182251E+02 S0
NUMERATOR BETA / RUD	NUMERATOR P / RUD	NUMERATOR R / RUD	NUMERATOR PHI / RUD
2.9790483E-02 S3 3.5842285E+00 S2 5.8208065E+00 S1 -1.0246772E-01 S0	9-4961958E+00 S3 -8.2597911E-01 S2 2-2674347E+01 S1 -8.1455231E-02 S0	-2.8069754E+00 S3 -5.7596960E+00 S2 1-3213460E+00 S1 1.0529442E+00 S0	0.0000000E+00 S3 9-2790651E+00 S2 -1.2715130E+00 S1 2.2776596E+01 S0
NUMERATOR AY / AIL	NUMERATOR AY / RUD	NUMERATOR /	
-1-7580338E+01 S4 -3-2709717E+01 S3 -1-5582324E+02 S2 -2-0719141E+02 S1 -1-8545135E+01 S0	2-0693222E+01 S4 2-9651855E+01 S3 -2-1082544E+02 S2 -3-3053516E+02 S1 5-1470003E+00 S0		

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TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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AIRCRAFT STATE

MACH =	.90000	ALT =	30000.00	VTRFPS =	895.76
NZ =	.99930	ALPHA =	3.80104	BETA =	.00000
GAMMA =	.00000	THETA =	3.80106	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYZ =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-3.85964	FLAPS =	-.46384	STRAKES=	-4.60731
AILERON=	.00000	RUDDER =	.00000		
THRUST =	2441.760	X RPM =	28.30701		

DYNAMICS

CXAERO =	.00000000	CZAERO =	-.24029338
CLMAERO=	.00000000	CMMAERO=	.00000000
VC KTS =	346.571	DYN PR =	357.36450

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	.3193833	-5.9415541	1.7237587	.0000000
PITCH RATE(PER RAD)	.0000000	-8.0019798	-8.8417330	.0000000
STRAKE (PER RAD)	.0093769	-.1897161	-.2548249	.0000000
MACH (PER M #)	-.0749215	-.2726399	-.1337801	1353.0637207
ALPHA DOT (PER RAD)	.0000000	-.4482737	-1.2793598	.0000000
CANARD (PER RAD)	-.0062467	-.4191260	1.0069675	.0000000
FLAPERON (PER RAD)	.0309398	-.1.5183449	-.6590127	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.0788183	.2237321	-.0706861
ROLL RATE (PER RAD)	.0000000	-.0116976	-.4041967
YAW RATE (PER RAD)	.0000000	-.1601692	.1834191
AILERON (PER RAD)	-.2980881	.0524364	.1603577
RUDDER (PER RAD)	.2385777	-.1413351	.0447574

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TASK # 080000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 3

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES
LONGITUDINAL SYSTEM

	Z FT/SEC**2	M RAD/SEC**2	X FT/SEC**2
ALPHA (PER RAD)	-796.6970215	16.5060730	41.5146484
ALPHADOT (PER R/S)	-24.02936	-0.0495848	.0000000
Q (PER R/S)	-4.3083305	-344.1961	.0000000
VEL (PER FT/S)	-0.0492910	-0.0024566	-0.0166839
STRAKE (PER RAD)	-25.3453827	-2.4614649	1.3195210
FLAPRN (PER RAD)	-202.8653979	-6.3656931	4.1334457
CANARD (PER RAD)	-55.9936981	9.7267437	-.8345309

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-1.668E-01	.4151E+02	-.5938E+02	-.3210E+02	.1320E+01	.4133E+01	-.8345E+00
-.5513E-04	-.8911E+00	.9949E+00	-.2386E-02	-.2835E-01	-.2269E+00	-.6263E-01
-.2454E-02	-.1655E+02	-.3935E+00	.1183E-03	-.2460E+01	-.6354E+01	.9730E+01
.0000E+00	.0000E+00	.0000E+00	.0000E+00	.0000E+00	.0000E+00	.0000E+00

111

B Matrix:

SYSTEM POLES

-4.7228603E+00	/+J (0.0000000E+00)
3.4459734E+00	/+J (0.0000000E+00)
-1.2221541E-02	/+J (7.060878E-02)
-1.2221541E-02	/+J (-7.7060878E-02)

DYNAMICS

PERIOD= 81.5353 WD= .07706
ZETA= -.15664 WN= .07802

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CHARACTERISTIC POLYNOMIAL

NUMERATOR U/STRK	ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
1.3195210E+00 S3	-2.8349683E-02 S3	-2.4600592E+00 S3	0.0000000E+00 S3
1.465949E+02 S2	-2.4592457E+00 S2	-2.7057142E+00 S2	-2.4600592E+00 S2
1.1367815E+02 S1	-4.2319588E-02 S1	-5.1233392E-02 S1	-2.7057142E+00 S1
8.5736298E+01 S0	-2.0153148E-03 S0	1.0262418E-05 S0	-5.1233392E-02 S0
NUMERATOR U/FLAP	ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
4.1334457E+00 S3	-2.2688955E-01 S3	-6.3544426E+00 S3	0.0000000E+00 S3
3.7322510E+02 S2	-6.4154148E+00 S2	-9.5338907E+00 S2	-6.3544426E+00 S2
4.3045459E+02 S1	-8.9699149E-02 S1	-1.6135871E-01 S1	-9.5338907E+00 S1
3.0313257E+02 S0	6.9046989E-03 S0	2.6230060E-05 S0	-1.6135871E-01 S0
NUMERATOR U/CAN	ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
-8.3453089E-01 S3	-6.2630892E-02 S3	9.-7298439E+00 S3	0.0000000E+00 S3
-5.8146263E+02 S2	9.-6547003E+00 S2	7.7984037E+00 S2	9.-7298439E+00 S2
-3.5137549E+02 S1	1.-8091846E-01 S1	1.-5859735E-01 S1	7.-7984037E+00 S1
-2.4607307E+02 S0	2.1764699E-02 S0	-4.0898129E-05 S0	1.-5859735E-01 S0
NUMERATOR AN/STRK	AN/FLAP	NUMERATOR AN/CAN	NUMERATOR AN/CAN
-2.5338577E+01 S4	-2.0279089E+02 S4	-5.5978668E+01 S4	-5.5978668E+01 S4
7.2705078E-01 S3	-5.-4496094E+01 S3	-6.-7164063E+01 S3	-6.-7164063E+01 S3
2.3752600E+03 S2	8.-4275391E+03 S2	-6.-7876523E+03 S2	-6.-7876523E+03 S2
3.-8219543E+01 S1	1.-3005711E+02 S1	-1.-0566628E+02 S1	-1.-0566628E+02 S1
-1.-1844641E-01 S0	-3.-6760068E-01 S0	3.-7482125E-01 S0	3.-7482125E-01 S0

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 5

LATERAL-DIR. SYSTEM

3DODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-144.1262207	-25.2312775	6.7833357
P	(PER R/S)	.00000000	-2.4639597	-.0917765
R	(PER R/S)	.00000000	1.0830641	-.0455994
AILERON	(PER RAD)	-39.8235016	65.0513458	4.0579405
RUDDER	(PER RAD)	31.8731232	15.9806738	-4.2836924

A Matrix:

BETA	P	R	PHI	AIL	RUD
-1.609E+00	.66229E-01	-.9978E+00	.3584E-01	-.4446E-01	.3558E-01
-.2523E+02	-.2464E+01	*.1083E+01	.0000E+00	.6505E+02	.1598E+02
-.6783E+01	-.9178E-01	-.4560E-01	.0000E+00	.4058E+01	.4284E+01
.0000E+00	.1000E+01	.6644E-01	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

$$\begin{aligned} & -1.6325730E-01 \quad /+J(-2.8804131E+00) \\ & -1.6325730E-01 \quad /+J(-2.8804131E+00) \\ & -2.3575726E+00 \quad /+J(0.0000000E+00) \\ & 1.3626251E-02 \quad /+J(0.0000000E+00) \end{aligned}$$

DYNAMICS

$$\begin{aligned} \text{PERIOD} &= 2.1813 & WD &= 2.88041 \\ \text{ZETA} &= .05659 & WN &= 2.88504 \end{aligned}$$

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CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA / AIL	1.0000000E+00 S4 2.6704578E+00 S3 9.0565758E+00 S2 1.9499069E+01 S1 -2.6738268E-01 S0	NUMERATOR P / AIL	4.0579405E+00 S3 6.3797617E+00 S2 3.5841736E+01 S1 1.9484039E+01 S0	NUMERATOR R / AIL	0.0000000E+00 S3 6.5320938E+01 S2 1.9240692E+01 S1 5.4574634E+02 S0	NUMERATOR PHI / AIL	0.0000000E+00 S3 6.5320938E+01 S2 1.9240692E+01 S1 5.4574634E+02 S0
NUMERATOR BETA / RUD	-4.4457916E-02 S3 3.5582323E-02 S3 1.5177602E-01 S2 -1.1999264E+00 S1 2.7341551E-01 S0	NUMERATOR P / RUD	1.5980674E+01 S3 -2.2373219E+00 S2 -9.0231717E-02 S1 -7.7521522E-04 S0	NUMERATOR R / RUD	-4.-2836924E+00 S3 -1.-2669370E+01 S2 -1.-2359648E+00 S1 -1.-1451665E-02 S0	NUMERATOR PHI / RUD	0.0000000E+00 S3 1.-5696074E+01 S2 -3.-0657587E+00 S1 -1.-7234641E-01 S0
NUMERATOR AY / AIL	-3.9735901E+01 S4 -1.0023828E+02 S3 -3.8017407E+02 S2 -6.0411328E+02 S1 -2.8767838E+01 S0	NUMERATOR AY / RUD	3.1803009E+01 S4 6.9301270E+01 S3 -5.1718018E+02 S2 -1.1517698E+03 S1 1.5814255E+01 S0	NUMERATOR /			

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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AIRCRAFT STATE

MACH =	1.10000	ALT =	30000.00	VTRFPS =	1094.81
NZ =	.99930	ALPHA =	3.06149	BETA =	.00000
GAMMA =	.00000	THETA =	3.06151	ACGM =	15926.00
IYX =	4548.00	IYY =	49429.00	IIZ =	52531.00
IYZ =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.77283	FLAPS =	-1.18431	STRAKES=	-7.48768
AILERON=	.00000	RUDDER =	.00000		
THRUST =	6109.574	Z RPM =	60.54581		

DYNAMICS

CXAERO =	-.05323606	CYAERO =	.00000000	CZAERO =	-.16099501
CLXAERO=	.00000000	CMXAERO=	.00737481	CNMAERO=	.00000000
VC KTS =	435.123	DYN PR =	533.84131	RHO =	.00089076

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	-2543105	-6.2660198	-8387392	.0000000
PITCH RATE (PER RAD)	.0000000	-7.0107250	-9.1285238	.0000000
STRAKE (PER RAD)	-0108321	-.1586864	-.2843701	.0000000
MACH (PER M #)	-.0455308	.2147942	.0232477	2621.9914551
ALPHA DOT (PER RAD)	.0000000	-.4070342	-.15345993	.0000000
CANARD (PER RAD)	-.0217344	-.66669040	-.8720989	.0000000
FLAPERON (PER RAD)	.0278860	-.8441584	-.62222041	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CZ	CL
BETA (PER RAD)	-1.1677351	.2246048	-.0842797
ROLL RATE (PER RAD)	.0000000	.0644804	-.4943840
YAW RATE (PER RAD)	.0000000	-.4039204	.2384676
AILERON (PER RAD)	-.3552630	.0756314	-.1011095
RUDDER (PER RAD)	-.1345730	-.0834191	.0268597

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

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LONGITUDINAL SYSTEM
 BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		² FT/SEC**2	⁴ RAD/SEC**2	⁶ RAD/SEC**2	⁸ FT/SEC**2
ALPHA	(PER RAD)	-1247.8579102	12.0991507	48.9418182	
ALPHADOT	(PER R/S)	-2670870	-0.0728071	.0000000	
Q	(PER R/S)	-4.6134424	-6343302	.0000000	
VEL	(PER FT/S)	.0454000	-.0001056	-.0256512	
STRAKE	(PER RAD)	-31.6691132	-4.1033373	2.1617632	
FLAPRN	(PER RAD)	-168.4690399	-8.9781361	5.5652122	
CANARD	(PER RAD)	-133.0943146	12.5840082	-4.3375406	

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-2565E-01	-4894E+02	-5847E+02	-3213E+02	-2162E+01	.5565E+01	-4338E+01
-4152E-04	-1141E+01	.9955E+00	-1571E-02	-.2896E-01	-.1541E+00	-1217E+00
-1086E-03	.1218E+02	-5068E+00	.1144E-03	-.4101E+01	-.8967E+01	-1259E+02
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-4.3234386E+00	'+J(0.0000000E+00)
-4.5898989E-02	'+J(0.0000000E+00)
2.6716681E+00	'+J(0.0000000E+00)
2.4054203E-02	'+J(0.0000000E+00)

CHARACTERISTIC POLYNOMIAL

1.000000E+00 S4

1.6736021E+00 S3

-1.1515745E+01 S2

-2.5414598E-01 S1

1.2747411E-02 S0

NUMERATOR U/STRK

2.1617632E+00 S3

2.4194943E+02 S2

2.0053189E+02 S1

1.6205321E+02 S0

NUMERATOR ALP/STRK

-2.896705E-02 S3

-4.0982561E+00 S2

-8.8706970E-02 S1

5.7373755E-03 S0

NUMERATOR Q/STRK

-4.1012287E+00 S3

-5.1383133E+00 S2

-1.1978424E-01 S1

7.8580315E-06 S0

NUMERATOR THT/STAK

0.0000000E+00 S3

-4.1012287E+00 S2

-5.1383133E+00 S1

-1.1978424E-01 S0

NUMERATOR THT/FLAP

0.0000000E+00 S3

-8.9669189E+00 S2

-1.2339924E+01 S1

-2.8944868E-01 S0

NUMERATOR Q/FLAP

-8.9669189E+00 S3

-1.2339924E+01 S2

-2.8944868E-01 S1

1.7188941E-05 S0

NUMERATOR Q/CAN

-1.2171179E-01 S3

1.2471680E+01 S2

2.7079856E-01 S1

-1.68880456E-02 S0

NUMERATOR AN/STRK

-4.3375406E+00 S3

-7.4942700E+02 S2

-4.9748804E+02 S1

-4.1510034E+02 S0

NUMERATOR AN/FLAP

-1.68427789E+02 S4

-4.5675781E+01 S3

1.3262492E+04 S2

3.0929736E+02 S1

-5.1616073E-01 S0

NUMERATOR AN/CAN

-1.3306180E+02 S4

-1.3249219E+02 S3

-1.4125254E+04 S2

-3.2807666E+02 S1

5.48688954E-01 S0

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-233.0455017	-45.8180847	9.8951597
P	(PER R/S)	.00000000	-3.6630659	-.0864285
R	(PER R/S)	.00000000	1.6703815	-.1985572
AILERON	(PER RAD)	-70.9000549	62.1588593	6.0304470
RUDDER	(PER RAD)	26.8568115	14.3553991	-3.7676687

A Matrix:

BETA	P	R	PHI	AIL	RUD
-2129E+00	5341E-01	-.9986E+00	.2935E-01	-.6476E-01	.2453E-01
-4582E+02	-3663E+01	.1670E+01	.0000E+00	.6216E+02	.1436E+02
9895E+01	-.8643E-01	-.1986E+00	.0000E+00	.6030E+01	-.3768E+01
.0000E+00	-1000E+01	.5348E-01	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-3.0630112E-01	'+J(3.4396019E+00)
-3.0630112E-01	'+J(-3.4396019E+00)
-3.4686584E+00	'+J(0.00000000E+00)
6.7980587E-03	'+J(0.00000000E+00)

DYNAMICS

PERIOD= 1.8267 WD= 3.43960
 ZETA= .08870 WN= 3.45321

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D23 PAGE 6

CHARACTERISTIC POLYNOMIAL

NUMERATOR	AY / AIL	NUMERATOR	AY / RUD	NUMERATOR	R / AIL	NUMERATOR	PHI / AIL
1.0000000E+00 S4	P / AIL	6.0304470E+00 S3	R / RUD	6.0304470E+00 S3	0.0000000E+00 S3	0.0000000E+00 S3	0.0000000E+00 S3
4.0744858E+00 S3	6.2158859E+01 S3	1.7360474E+01 S2	1.7360474E+01 S2	1.7360474E+01 S2	6.2481384E+01 S2	6.2481384E+01 S2	6.2481384E+01 S2
1.4021755E+01 S2	3.8613708E+01 S2	4.8560833E+01 S1	4.8560833E+01 S1	4.8560833E+01 S1	3.9542206E+01 S1	3.9542206E+01 S1	3.9542206E+01 S1
4.1266907E+01 S1	8.9439307E+02 S1	2.6157883E+01 S0	2.6157883E+01 S0	2.6157883E+01 S0	8.9699023E+02 S0	8.9699023E+02 S0	8.9699023E+02 S0
-2.8119493E-01 S0	-1.3998194E+00 S0						
NUMERATOR	BETA / AIL	NUMERATOR	P / RUD	NUMERATOR	R / RUD	NUMERATOR	PHI / RUD
-6.4759851E-02 S3	1.4355399E+01 S3	1.4355399E+00 S3	1.4355399E+00 S3	1.4355399E+00 S3	0.0000000E+00 S3	0.0000000E+00 S3	0.0000000E+00 S3
-2.9521704E+00 S2	-1.5113068E+00 S2	-1.5113068E+01 S2	-1.5601193E+01 S2	-1.5601193E+01 S2	1.4153890E+01 S2	1.4153890E+01 S2	1.4153890E+01 S2
-1.3719522E+01 S1	-3.1085373E+01 S1	-3.1085373E+00 S1	-3.8486757E+00 S1	-3.8486757E+00 S1	-2.3457184E+00 S1	-2.3457184E+00 S1	-2.3457184E+00 S1
6.8403101E-01 S0	4.7830295E-02 S0	4.7830295E-02 S0	-6.9729071E-01 S0	-6.9729071E-01 S0	-3.1291214E+01 S0	-3.1291214E+01 S0	-3.1291214E+01 S0
NUMERATOR	AY / AIL	NUMERATOR	AY / RUD	NUMERATOR	/	NUMERATOR	/
-7.0798920E+01 S4	2.6818481E+01 S4	9.6483887E+01 S3	-7.2482324E+02 S2	-7.2482324E+02 S2			
-2.6917700E+02 S3	-7.2482324E+02 S2	-7.2482324E+02 S2	-2.4508887E+03 S1	-2.4508887E+03 S1			
2.8471729E+02 S2	2.7038281E+02 S1	2.1563889E+01 S0	2.1563889E+01 S0	2.1563889E+01 S0			
-1.3953349E+02 S0							

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task # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D23 PAGE

PAGE

AIRCRAFT STATEMENT

MACH	=	1.30000	ALT	=	300000.00	VTRFPS	=	1293.87
NZ	=	.99880	ALPHA	=	2.90715	BETA	=	.000000
GAMMA	=	.00000	THETA	=	2.90717	ACGW	=	15926.00
IXX	=	4548.00	IYY	=	49429.00	IZZ	=	52531.00
IYI	=	1827.00	XCG	=	450.56006	ZCG	=	64.88000
SEAK DOWN:	F		NY	=	.000000	NX	=	.000000
NORMAI MODE:	I		DR MODE:	F		AR MODE:	F	

CONTROLS***

CANARDS =	-1.98113	FLAPS =	-1.68678	STRAKES =	-8.75000
AILERON =	.00000	RUDDER =	.00000		
THRUST =	9583.355	% RPM =	87.75790		

★ ★ * DYNAMICS * * *

CXAERO =	- .06360304	CYAERO =	.00000000	CZAERO =	- .11527956
CLMAERO=	.00000000	CMM AERO=	.00827518	CNMAERO=	.00000000
VS KTS =	522.812	DYN PR =	745.61182	RHO =	.000889076

A/C CONSTANTS

$$\text{AREA} = 185.0490 \quad \text{CBAR} = 7.2200 \quad \text{SPAN} = 7.2000$$

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-023 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CY BODY	CZ BODY	CM	THRUST(LBS)
ALPHA (PER RAD)	.2021586	-5.6125793	-5.6427326	-3250694	.0000000
PITCH RATE(PER RAD)	.0000000	-5.6427326	-7.8051939		.0000000
STRAKE (PER RAD)	.0097723	-1.229883	-2577143		.0000000
MACH (PER M #)	-.0254503	.0542617	-.1931579		.5525.8203125
ALPHA DOT (PER RAD)	.0000000	-.3696541	-1.3849792		.0000000
CANARD (PER RAD)	-.0276658	-.5066074	.6671954		.0000000
FLAPERON (PER RAD)	.0200535	-.5758265	-.6038276		.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CZ BODY	CL	CN
ZETA (PER RAD)	-1.2073336	.2343938	-.0891617	
ROLL RATE (PER RAD)	.0000000	.0640213	-.5135223	
YAW RATE (PER RAD)	.0000000	-.4308162	.2139636	
AILERON (PER RAD)	-.2677095	.0993752	.0615668	
RUDDER (PER RAD)	.0717860	-.0524813	.0153248	

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TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5

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LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z	M	X
	FT/SEC**2	RAD/SEC**2	FT/SEC**2
ALPHA (PER RAD)	-1562.6762695	6.2950411	53.9412994
ALPHADOT (PER R/S)	-.28667408	-.0776773	.0CJ0000
(PER R/S)	-4.3883591	-.4388876	.0000000
Q (PER FT/S)	-.0268946	-.0040022	-.0254798
VEL (PER FT/S)	-34.2815552	-5.1938839	2.7239237
STRAKE (PER RAD)	-160.5049438	-12.1693316	5.5896845
FLAPRN (PER RAD)	-141.2109222	13.4464226	-7.7115173
CANARD (PER RAD)			

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-2548E-01	.5394E+02	-.6562E+02	-.3213E+02	.2724E+01	.5590E+01	-.7712E+01
-2081E-04	-.1209E+01	-.9964E+00	-.1263E-02	-.2652E-01	-.1242E+00	-.1093E+00
-.4004E-02	-.6389E+01	-.5163E+00	.9807E-04	-.5192E+01	-.1216E+02	.1345E+02
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

* ***SYSTEM POLES***

-3.4514618E+00 ,+J(0.0000000E+00)
-1.7667542E+00 ,+J(0.0000000E+00)
-3.3055067E-02 ,+J(1.5403634E-01)
-3.3055067E-02 ,+J(-1.5403634E-01)

DYNAMICS

PERIOD= 40.7903 WD= .15404
ZETA= .20982 WN= .15754

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4	NUMERATOR ALP/STRK	NUMERATOR Q/STRK	NUMERATOR THT/STRK
1.7508039E+00 S3	-2.6523590E-02 S3	-5.1918240E+00 S3	0.0000000E+00 S3
-5.9616385E+00 S2	-5.1873589E+00 S2	-6.5897751E+00 S2	-5.1918240E+00 S2
-3.6132950E-01 S1	-1.2237698E-01 S1	-1.6552413E-01 S1	-6.5697751E+00 S1
-1.5134710E-01 S0	7.0635192E-03 S0	4.4522394E-06 S0	-1.6552413E-01 S0
5.5896845E+00 S3	NUMERATOR ALP/FLAP	NUMERATOR Q/FLAP	NUMERATOR THT/FLAP
8.0088525E+02 S2	-1.2182865E+01 S2	-1.2159685E+01 S3	0.0000000E+00 S3
7.1843774E+02 S1	-2.6797819E-01 S1	-1.58227151E+01 S2	-1.2159685E+01 S2
4.9876563E+02 S0	2.45224089E-02 S0	-3.8065135E-01 S1	-1.58227151E+01 S1
7.7115173E+00 S3	NUMERATOR ALP/CAN	NUMERATOR Q/CAN	NUMERATOR THT/CAN
-9.0213306E+02 S2	-1.0925466E-01 S3	1.3454909E+01 S3	0.0000000E+00 S3
-6.8965405E+02 S1	1.3346892E+01 S2	1.5943207E+01 S2	1.3454909E+01 S2
-5.0126563E+02 S0	3.6418360E-01 S1	4.4150287E-01 S1	1.5943207E+01 S1
-3.4273956E+01 S4	NUMERATOR AN/STRK	NUMERATOR AN/FLAP	NUMERATOR AN/CAN
5.7695313E+00 S3	-1.6046939E+02 S4	-1.4117958E+02 S4	-1.4117958E+02 S4
8.3487422E+03 S2	-2.9953125E+01 S3	-1.3958203E+02 S3	-1.3958203E+02 S3
2.1226532E+02 S1	2.0085824E+04 S2	-2.0109359E+04 S2	-2.0109359E+04 S2
-2.7585214E-01 S0	4.9774390E+02 S1	-5.3856445E+02 S1	-5.3856445E+02 S1

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-336.5300293	-67.7944031	14.3876352
P	(PER R/S)	.0000000	-.4.497595	-.1083472
R	(PER R/S)	.0000000	1.7503071	-.2626379
AILERON	(PER RAD)	-74.6208801	54.4156952	.8.9920788
RUDDER	(PER RAD)	20.0095062	11.2973680	-3.3564367

A Matrix:

QETA	P	R	PHI	AIL	RUD
-2601E+00	.5072E-01	-.9987E+00	.2483E-01	-.5767E-01	.1546E-01
-6779E+02	-.4498E+01	.1750E+01	.0000E+00	.5442E+02	.1130E+02
-1639E+02	-.1083E+00	-.2626E+00	.0000E+00	.8992E+01	-.3356E+01
.0000E+00	.1000E+01	.5078E-01	.0000E+00	.0000E+00	.0000E+00

G Matrix:

SYSTEM POLES

```

-3.7424850E-01 /+J ( 4. 1345549E+00)
-3.7424850E-01 /+J ( -4. 1345549E+00)
-4.2754822E+00 /+J ( 0.0000000E+00)
3.7193897E-03 /+J ( 0.0000000E+00)

```

DYNAMICS

```

PERIOD= 1.5197 WD= 4.13455
ZETA= .09015 WN= 4.15146

```

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4
 5.-0202923E+00 S3
 2.-0416443E+01 S2
 7.-3609711E+01 S1
 -2.7412945E-01 S0

NUMERATOR BETA / AIL
 5.-7672545E-02 S3
 6.-4952192E+00 S2
 -3.-1695435E+01 S1
 7.-8938073E-01 S0

NUMERATOR P / AIL
 5.-4415695E+01 S3
 4.-8093628E+01 S2
 1.-3981187E+03 S1
 -1.-7573566E+00 S0

NUMERATOR P / RUD
 1.-1297368E+01 S3
 -1.-0177202E+00 S2
 -6.-5563751E+01 S1
 8.-1937850E-02 S0

NUMERATOR AY / AIL
 -7.-6526841E+01 S4
 -3.-4439600E+02 S3
 7.-1509790E+02 S2
 5.-1723125E+03 S1
 -2.-4527293E+02 S0

NUMERATOR R / AIL
 8.9920788E+00 S3
 3.-6055634E+01 S2
 7.-5455032E+01 S1
 3.-4532474E+01 S0

NUMERATOR R / RUD
 -3.-3564367E+00 S3
 -1.-6970306E+01 S2
 -6.-4272776E+00 S1
 -1.-6143332E+00 S0

NUMERATOR AY / QUD
 1.-9983749E+01 S4
 8.-8588379E+01 S3
 -9.-6457471E+02 S2
 -4.-0624922E+03 S1
 2.-5791794E+01 S0

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TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D24 PAGE 1

AIRCRAFT STATE

MACH =	.70000	ALT =	40000.00	VTRFPS =	677.95
NZ =	.99592	ALPHA =	5.68030	BETA =	.000000
GAMMA =	.00000	THETA =	5.68032	ACGW =	15926.00
IXX =	4548.00	IYI =	49429.00	IIZ =	52531.00
IYX =	1827.00	XCG =	450.56006	ZCG =	64.88000
SEAR DOWN:	F	NY =	.00000	NX =	.000000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.77892	FLAPS =	9.99677	STRAKES=	-7.26573
AILERONE=	.00300	RUDDER =	.00000		
THRUST =	1840.380	Z RPM =	38.72850		

DYNAMICS

CAERO =	-.01057255	CYAERO =	.00000000	CZAERO =	-.63449287
CLMAERO=	.00000000	CMMAERO=	.00877998	CNMAERO=	.00000000
VC KTS =	209.378	DYN PR =	134.97624	RHO =	.00058734

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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04/23/92 10:19:32 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

		CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA	(PER RAD)	.3641798	-5.2396326	1.6744871	.0000000
PITCH RATE(PER RAD)		.0000000	-7.2729263	-7.6916559	.0000000
STRAKE (PER RAD)		.0262024	-.2128507	-.3325030	.0000000
MACH (PER M/H)		-.0316767	-.2483886	.0187909	1324.5139160
ALPHA DOT (PER RAD)		.0000000	-.4739590	-1.1184778	.0000000
CANARD (PER RAD)		-.0605030	-.3027340	.8751573	.0000000
FLAPERON (PER RAD)		.0358103	-1.5469923	-.5789520	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

		CY BODY	CN	CL
ZETA	(PER RAD)	-1.1372070	.2638459	-.0358600
ROLL RATE (PER RAD)		.0000000	-.0337078	-.3552643
YAW RATE (PER RAD)		.0000000	-.1845067	.2046546
AILERON (PER RAD)		-.2182385	.0754722	.2177144
RUDDER (PER RAD)		.2681669	-.1566859	.0460607

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TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5

PAGE

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BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

	Z FT/SEC**2	M RAD/SEC**2	X FT/SEC**2
ALPHA	-268.9685059	6.0603180	17.9809265
(PER RAD)	-.1260996	-.0215158	.0000000
(PER R/S)	-1.9541512	-.1533111	.0000000
(PER R/S)	-.0682644	-.0007512	-.0031283
Q	(PER FT/S)	-10.7402487	-1.2130899
VEL	(PER RAD)	-78.0600536	-2.1122236
STRAKE	(PER RAD)	-15.2757215	3.1928873
FLAPRN			
CANARD			

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-.3128E-02	*1798E+02	-.6710E+02	-.3202E+02	*1322E+01	*1807E+01	-.3053E+01
-.1012E-03	-.3986E+00	.996E+00	-.4720E-02	-.1592E-01	-.1157E+00	-.2264E-01
-.7491E-03	*6069E+01	-.1748E+00	*1015E-03	-.1213E+01	-.2110E+01	*3193E+01
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-2.7564287E+00	/+J (0.0000000E+00)
2.1905737E+00	/+J (0.0000000E+00)
-5.3282194E-03	/+J (6.9342077E-02)
-5.3282194E-03	/+J (-6.9342077E-02)

DYNAMICS

PERIOD=	90.6114	WD=	*06934
ZETA=	.07661	WN=	.06955

04/23/92 10:19:32 TASK # 09000006

MODELS ENCORE COMPUTER CORP. MPX=32 3.5 U01

MPX.D24 PAGE 4

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4

5.7650864E-01 S3

-6.0272713E+00 S2

-6.1579615E-02 S1

-2.9190347E-02 S0

NUMERATOR U/STAK

1.3221540E+00 S3

.8.1849289E+01 S2

4.8051651E+01 S1

1.8710846E+01 S0

NUMERATOR U/FLAP

1.8069592E+00 S3

1.4052264E+02 S2

1.2210005E+02 S1

4.9634048E+01 S0

NUMERATOR U/FLAP

-1.1568743E-01 S3

-2.1239929E+00 S2

-6.5628836E-03 S1

-4.0208884E-03 S0

NUMERATOR ALP/STRK

-1.5917383E-02 S3

-1.2119741E+00 S2

-6.5092221E-03 S1

-3.5234375E-03 S0

NUMERATOR ALP/FLAP

-1.1568743E-01 S3

-2.1239929E+00 S2

-6.5628836E-03 S1

-4.0208884E-03 S0

NUMERATOR ALP/CAN

-2.2639096E-02 S3

3.1798096E+00 S2

2.0028185E-02 S1

1.0827433E-02 S0

NUMERATOR AN/STRK

-1.0738237E+01 S4

5.2172352E-01 S3

3.8627319E+02 S2

-8.5782146E-01 S1

-1.6065575E-02 S0

NUMERATOR AN/FLAP

-7.8045441E+01 S4

-9.6188965E+00 S3

1.0352151E+03 S2

-1.7453490E+00 S1

-2.8179854E-02 S0

NUMERATOR Q/STRK

-1.2127476E+00 S3

-5.8481032E-01 S2

-5.0124153E-03 S1

-1.5358103E-07 S0

NUMERATOR Q/FLAP

-2.1097345E+00 S3

-1.5510302E+00 S2

-8.7552108E-03 S1

-4.4321797E-07 S0

NUMERATOR Q/CAN

3.1933746E+00 S3

1.1478243E+00 S2

1.2451384E-02 S1

-2.7503677E-07 S0

NUMERATOR AN/CAN

-1.5272861E+01 S4

-9.1513672E+00 S3

-7.5066821E+02 S2

2.5596762E+00 S1

3.9836809E-02 S0

04/23/92 10:19:32 TASK # 03000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y FT/SEC**2	L RAD/SEC**2	N RAD/SEC**2
BETA	(PER RAD)	-57.3826141	-4.0425940	3.2716923
P	(PER R/S)	.0000000	-1.0832376	-.0464195
R	(PER R/S)	.0000000	.6024585	-.0269151
AILERON	(PER RAD)	-11.0121489	.33.3805389	2.1370306
RUDDER	(PER RAD)	13.5314951	6.1524420	-1.8124237

A Matrix:

BETA	P	R	PHI	AIL	AIL	RUD	RUD
-.84664E-01	.9898E-01	-.9951E+00	.4722E-01	-.1624E-01	.1996E-01	.0000E+00	.0000E+00
-.4043E+01	-.1083E+01	-.6025E+00	.0000E+00	.3338E+02	.6152E+01	.0000E+00	.0000E+00
.3272E+01	-.4642E-01	-.2692E-01	.0000E+00	.2137E+01	-.1812E+01	.0000E+00	.0000E+00
.00000E+00	.1000E+01	-.9947E-01	.0000E+00	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

$$\begin{aligned} & -8.9169919E-02 \quad ,+j(\quad 1.9095812E+00) \\ & -8.9169919E-02 \quad ,+j(\quad -1.9095812E+00) \\ & -1.0441036E+00 \quad ,+j(\quad 0.0000000E+00) \\ & 2.7642813E-02 \quad ,+j(\quad 0.0000000E+00) \end{aligned}$$

DYNAMICS

$$\begin{aligned} \text{PERIOD} &= 3.2903 & WD &= 1.90958 \\ \text{ZETA} &= .046664 & WN &= 1.91166 \end{aligned}$$

04/23/92

10:19:32

TASK # 080000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

MPX.D24 PAGE 6

CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA/ AIL

1.0000000E+00 S4
 1.1967937E+00 S3
 3.8068371E+00 S2
 3.7094078E+00 S1
 -1.0547316E-01 S0

NUMERATOR AY/ AIL

-1.9959368E-02 S3
 1.1593361E+00 S2
 1.0402021E+00 S1
 1.0682392E-01 S0

NUMERATOR P/ AIL

3.3380539E+01 S3
 5.0769377E+00 S2
 1.1742609E+02 S1
 -5.5359787E-01 S0

NUMERATOR AY/ RUD

6.1524420E+00 S3
 -4.8625565E-01 S2
 1.2697907E+01 S1
 -6.0138572E-02 S0

NUMERATOR P/ RUD

2.1370306E+00 S3
 8.9314073E-01 S2
 1.1668612E+01 S1
 5.5654163E+00 S0

NUMERATOR AY/ RUD

1.3465055E+01 S4
 6.9174805E+00 S3
 -9.6280853E+01 S2
 -8.9026611E+01 S1
 1.6901846E+00 S0

NUMERATOR P/ RUD

0.0000000E+00 S3
 3.3593094E+01 S2
 5.1657743E+00 S1
 1.1858672E+02 S0

NUMERATOR PHI/ AIL

0.0000000E+00 S3
 3.3593094E+01 S2
 5.1657743E+00 S1
 1.1858672E+02 S0

NUMERATOR PHI/ RUD

0.0000000E+00 S3
 5.9721680E+00 S2
 -7.1870470E-01 S1
 1.2812416E+01 S0

04/23/92 10:10:51 TASK # 080000000 MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 1

AIRCRAFT STATE

YACH =	.900000	ALT =	40000.00	VTRFPS =	871.65
YZ =	.99791	ALPHA =	4.58740	BETA =	.00000
GAMMA =	.000000	THETA =	4.58742	ACGW =	15926.00
IYX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYI =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDSS=	-3.68992	FLAPS =	2.44223	STRAKES=	-5.33240
AILERONN=	.000000	RUDDER =	.00000		
THRUST =	1916.181	% RPM =	35.28230		

DYNAMICS

CAERO =	-.01555936	CYAERO =	.00000000	CZAERO =	-.38450485
CLMAERO=	.00000000	CMMAERO=	.00553221	CNMMAERO=	.00000000
VC KTS =	277.196	DYN PR =	223.12401	RHO =	.00058734

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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04/23/92 10:19:51 TASK # 08000000

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D24 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CW	THRUST(LAS)
ALPHA (PER RAD)	.3232349	-6.0327034	1.7513971	.0000000
GITCH RATE(PER RAD)	.00000000	-8.0018721	-8.8413353	.0000000
STRAKE (PER RAD)	.0074185	-.1913485	-.2966666	.0000000
YACH (PER M #)	-.0791032	-.2048849	-.2091774	1189.0085449
ALPHA DOT (PER RAD)	.00000000	-.4485797	-1.2793598	.0000000
CANARD (PER RAD)	-.0152292	-.4517300	1.0257025	.0000000
FLAPERON (PER RAD)	.0309393	-.1.5183449	-.6590127	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
ZETA (PER RAD)	-1.1040640	.2412131	-.0665323
ROLL RATE (PER RAD)	.00000000	-.0193545	-.3948224
YAW RATE (PER RAD)	.00000000	-.1612836	.2107756
AILERON (PER RAD)	-.2988185	.0539945	.1685113
RUDDER (PER RAD)	.2543252	-.1518290	.0478503

LONGITUDINAL SYSTEM
 BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		Z FT/SEC**2	M RAD/SEC**2	X FT/SEC**2
ALPHA	(PER RAD)	-506.3220215	10.4098425	26.1088867
ALPHADOT	(PER R/S)	-1539734	-0.0317509	*0000000
Q	(PER R/S)	-2.7642975	-2208351	*0000000
VEL	(PER FT/S)	-0447719	-0022126	-0097530
STRAKE	(PER RAD)	-15.9607983	-1.7891846	*6187908
FLAPRN	(PER RAD)	-126.6485138	-3.9744797	2.5807581
CANARD	(PER RAD)	-37.6797943	6.1859674	-1.2703056

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-9753E-02	2611E+02	-6971E+02	-3207E+02	-6188E+00	2581E+01	-1270E+01
-5152E-04	-5826E+00	.99666E+00	-2961E-02	-1837E-01	-1457E+00	-4336E-01
-2211E-02	.1043E+02	-2525E+00	.9402E-04	.1789E+01	-.3970E+01	.6187E+01
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

$$\begin{aligned}
 & -3.6653728E+00 \quad r+j(0.0000000E+00) \\
 & 2.8410664E+00 \quad r+j(0.0000000E+00) \\
 & -1.0276511E-02 \quad r+j(-7.4189186E-02) \\
 & -1.0276511E-02 \quad r+j(-7.4189186E-02)
 \end{aligned}$$

DYNAMICS

$$\begin{aligned}
 \text{PERIOD} &= 84.6914 & \text{WD} &= 0.07419 \\
 \text{ZETA} &= .13721 & \text{WN} &= .07490
 \end{aligned}$$

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4
 8.4487182E-01 S3
 -1.0390960E+01 S2
 -2.0940661E-01 S1
 -5.8614418E-02 S0

NUMERATOR U/STRK

6.1879081E-01 S3
 1.2472815E+02 S2
 9.0361526E+01 S1
 3.9721420E+01 S0

NUMERATOR ALP/STRK

-1.8366557E-02 S3
 -1.787441E+00 S2
 -1.7097607E-02 S1
 -1.5968226E-03 S0

NUMERATOR ALP/FLAP

-1.4573812E-01 S3
 -3.9948721E+00 S2
 -2.4693001E-02 S1
 3.9073564E-03 S0

NUMERATOR U/CAN

-1.2703056E+00 S3
 -4.3353982E+02 S2
 -2.4449826E+02 S1
 -1.0163135E+02 S0

NUMERATOR Q/STRK

-1.7886019E+00 S3
 -1.2524557E+00 S2
 -1.4506564E-02 S1
 4.6108522E-07 S0

NUMERATOR Q/FLAP

-3.9698524E+00 S3
 -3.8772240E+00 S2
 -3.9018486E-02 S1
 1.2778273E-06 S0

NUMERATOR AN/CAN

-4.3359239E-02 S3
 6.1552610E+00 S2
 7.3440433E-02 S1
 1.3109546E-02 S0

NUMERATOR Q/CAN

0.0000000E+00 S3
 -1.7886019E+00 S2
 -1.2524557E+00 S1
 -1.4506564E-02 S0

NUMERATOR AN/FLAP

-1.2662608E+02 S4
 -2.1738770E+01 S3
 3.3370959E+03 S2
 2.7319473E+01 S1
 -1.0151470E-01 S0

NUMERATOR AN/STRK

-1.5957973E+01 S4
 1.005594E+00 S3
 1.0687512E+03 S2
 7.9938745E+00 S1
 -3.7729688E-02 S0

NUMERATOR AN/CAN

-3.7673126E+01 S4
 -2.7875000E+01 S3
 -2.7145059E+03 S2
 -1.8470825E+01 S1
 1.1410826E-01 S0

04/23/92 10:19:51 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 5

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y	L	N
		FT/SEC**2	RAD/SEC**2	RAD/SEC**2
BETA	(PER RAD)	-92.0924225	-14.5608988	4.6504421
P	(PER R/S)	.0000000	-1.5453510	-.0602025
R	(PER R/S)	.0000000	-.8016621	-.0259171
AILERON	(PER RAD)	-24.9251251	42.6709595	2.6384134
RUDDER	(PER RAD)	21.2138367	10.66608400	-2.8751526

A Matrix:

BETA	P	R	PHI	AIL	RUD
-1.057E+00	.7998E-01	-.9968E+00	.3679E-01	-.2860E-01	.2434E-01
-.1456E+02	-.1545E+01	.8017E+00	.0000E+00	.4226E+02	.1066E+02
.4650E+01	-.6020E-01	-.2592E-01	.0000E+00	.2638E+01	-.2875E+01
.0000E+00	.1000E+01	.8024E-01	.0000E+00	.0000E+00	.0000E+00

B Matrix:

-1.1561203E-01	r+j (	2.3942432E+00)		
-1.1561203E-01	r+j (	-2.3942432E+00)		
-1.4631929E+00	r+j (	0.0000000E+00)		
1.7495833E-02	r+j (	0.0000000E+00)		

SYSTEM POLES

-1.1561203E-01
-1.1561203E-01
-1.4631929E+00
1.7495833E-02

DYNAMICS

PERIOD= 2.6243 WD= 2.39424
ZETA= .04823 WN= 2.39703

04/23/92 10:19:51 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

PAGE

MPX.D24

CHARACTERISTIC POLYNOMIAL

NUMERATOR BETA/ AIL
1.0000000E+00 S4
1.6769199E+00 S3
6.0544357E+00 S2
8.3006887E+00 S1
-1.4709139E-01 S0

NUMERATOR P/ AIL
4.2670959E+01 S3
8.1456594E+00 S2
2.3634219E+02 S1
-6.9941175E-01 S0

NUMERATOR P/ RUD
1.0660840E+01 S3
-1.2566423E+00 S2
7.5553284E+00 S1
-2.2769574E-02 S0

NUMERATOR AY/ AIL
2.4845276E+01 S4
-4.1222656E+01 S3
-2.1978247E+02 S2
-2.3755859E+02 S1
-7.6590424E+00 S0

NUMERATOR R/ AIL
2.6384134E+00 S3
1.-6541500E+00 S2
1.-8872421E+01 S1
8.7147017E+00 S0

NUMERATOR R/ RUD
-2.8751526E+00 S3
-5.-2755146E+00 S2
2.-7587050E-01 S1
2.-8377593E-01 S0

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TASK # 06000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX-D24 PAGE 1

AIRCRAFT STATE

MACH =	1.10000	ALT =	40000.00	VTRFPS =	1065.35
N2 =	.99813	ALPHA =	3.86584	BETA =	.00000
GAMMA =	.00000	THETA =	3.86586	ACGN =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IYX =	1327.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-2.89066	FLAPS =	-.29115	STRAKES=	-7.68836
AILERON=	.00000	RUDDER =	.00000		
THRUST =	4104.059	% RPM =	62.32430		

DYNAMICS

CAERO =	-.04913098	CYAERO =	.00000000	ZAERO =	-.25762522
CLMAERO=	.00000000	CNMAERO=	.00793071	CNMAERO=	.00000000
VC KTS =	350.281	DYN PR =	333.30859	RHO =	.00058734

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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04/23/92 10:20:10 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01

MPX.D24

PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

		CX BODY	CZ BODY	CM	THRUST(LBS)
ALPHA	(PER RAD)	-2597533	-6.1994114	.8500366	.0000000
PITCH RATE(PER RAD)		.0000000	-7.0175257	-9.1282816	.0000000
STRAKE	(PER RAD)	.0104088	-.1765047	-.3105793	.0000000
MACH	(PER M #)	-.0508395	.2583879	-.0228833	3000.6291504
ALPHA DOT	(PER RAD)	.0000000	-.4071669	-.15345602	.0000000
CANARD	(PER RAD)	-.0288025	-.6750320	.9066220	.0000000
FLAPERON	(PER RAD)	.0278860	-.89884005	-.6596896	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

		CY BODY	CN	CL
ZETA	(PER RAD)	-1.1827812	.2385445	-.0894301
ROLL RATE (PER RAD)		.0000000	.0587365	-.4734246
YAW RATE (PER RAD)		.0000000	-.4056902	.2523658
AILERON	(PER RAD)	-.35557255	.0734380	.1123293
RUDDER	(PER RAD)	.1535030	-.0965280	.0310031

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 3

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		FT/SEC**2	M	FT/SEC**2	X
ALPHA	(PER RAD)	-770.8933105	7.6177168	30.9267120	
ALPHADOT	(PER R/S)	-.1711344	-.0466344	*0000000	
Q	(PER R/S)	-2.9600163	-.2786695	*0000000	
VEL	(PER FT/S)	.0219260	-.0006171	-.0137817	
STRAKE	(PER RAD)	-21.993030	-2.7980766	1.2969751	
FLAPRN	(PER RAD)	-111.9438171	-5.9432883	3.4746866	
CANARD	(PER RAD)	-84.1113129	8.1679564	-3.5888901	

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-1.378E-01	.3093E+02	-.7183E+02	-.3210E+02	.1297E+01	.3475E+01	-.3589E+01
.2062E-04	-.7251E+00	-.9971E+00	-.2045E-02	-.2069E-01	-.1053E+00	-.7912E-01
-.6181E+03	.7652E+01	-.3252E+00	*.9515E-04	-.2797E+01	-.5938E+01	*.8172E+01
.0000E+00	.00000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

-3.3024405E+00 /+J (0.00000000E+00)
2.2530622E+00 /+J (0.00000000E+00)
-7.3574781E-03 /+J (3.4283292E-02)
-7.3574781E-03 /+J (-3.4283292E-02)

DYNAMICS

PERIOD=183.2725 WD= .03428
ZETA=.20983 WN= .03500

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 4

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4
1.0640841E+00 S3
-7.4238515E+00 S2
-1.0819161E-01 S1
-9.1476776E-03 S0

NUMERATOR U/STRK
1.2969751E+00 S3
2.0162851E+02 S2
1.5079558E+02 S1
7.0387589E+01 S0

NUMERATOR ALP/STRK
-2.0687696E-02 S3
-2.7953593E+00 S2
-2.8545175E-02 S1
2.3420961E-03 S0

NUMERATOR U/FLAP
3.4746866E+00 S3
4.2692432E+02 S2
3.4792847E+02 S1
1.6452283E+02 S0

NUMERATOR ALP/FLAP
-1.0529935E-01 S3
-5.9565086E+00 S2
-5.9586456E-02 S1
6.1912909E-03 S0

NUMERATOR U/CAN
-3.5888901E+00 S3
-5.9315527E+02 S2
-3.6672852E+02 S1
-1.7135297E+02 S0

NUMERATOR ALP/CAN
-7.9118843E-02 S3
8.1206884E+00 S2
3.8854969E-02 S1
-4.0726587E-03 S0

NUMERATOR AN/STRK
-2.1989533E+01 S4
1.3308105E+00 S3
2.3295974E+03 S2
2.7774551E+01 S1
-6.7721069E-02 S0

NUMERATOR AN/FLAP
-1.1192581E+02 S4
-1.9273438E+01 S3
5.4476367E+03 S2
6.5097275E+01 S1
-1.5561623E-01 S0

NUMERATOR AN/CAN
-8.4097778E+01 S4
-5.4164063E+01 S3
-5.6649633E+03 S2
-6.7646896E+01 S1
1.7182636E-01 S0

NUMERATOR THT/STRK
0.0000000E+00 S3
-2.7971115E+00 S2
-2.2259293E+00 S1
-2.2259293E+00 S0

NUMERATOR THT/FLAP
0.0000000E+00 S3
-5.9383783E+00 S2
-5.1958218E+00 S1
-5.6555351E-02 S0

NUMERATOR THT/CAN
0.0000000E+00 S3
8.1716461E+00 S2
5.4350100E+00 S1
5.4350100E+00 S0

NUMERATOR AN/STRK
-2.4097778E+01 S4
-5.4164063E+01 S3
-5.6649633E+03 S2
-6.7646896E+01 S1
1.7182636E-01 S0

04/23/92 10:20:10 TASK # 030000006

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MODELS ENCORE COMPUTER COPP. MPX-32 3.5 U01

MPX.D24

PAGE

LATERAL-DIR. SYSTEM
BODY-AXIS STABILITY DERIVATIVES

	Y	L	N
	FT/SEC**2	RAD/SEC**2	RAD/SEC**2
BETA (PER RAD)	-147.3787079	-30.3523254	6.5626097
P (PER R/S)	.0000000	-2.2511730	-.0543483
R (PER R/S)	.0000000	1.1378374	-.1258227
AILERON (PER RAD)	-44.3246613	42.9782257	3.8401041
RUDDER (PER RAD)	19.1270142	10.3424301	-2.7230482

A Matrix:

BETA	P	R	PHI	AIL	RUD
-1383E+00	.67425E-01	-.9977E+00	.3013E-01	-.4161E-01	.1795E-01
-.3035E+02	-.2251E+01	.1138E+01	.0000E+00	.4298E+02	.1034E+02
-.6563E+01	-.5435E-01	-.1258E+00	.0000E+00	.3840E+01	-.2723E+01
.0000E+00	.1000E+01	.6757E-01	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM PCLES

-2.3190653E-01	/+J(2.8774700E+00)
-2.3190653E-01	/+J(-2.8774700E+00)
-2.0598946E+00	/+J(0.0000000E+00)
8.3514936E-03	/+J(0.0000000E+00)

DYNAMICS

PERIOD= 2.1836 WD= 2.87747
ZETA= .03033 WN= 2.88680

26/23/92 10:20:10 TASK # 03000000

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 6

CHARACTERISTIC POLYNOMIAL

1.0000000E+00 S4
2.5153332E+01 S3
9.2679510E+00 S2
1.7088776E+01 S1
-1.4336807E-01 S0

NUMERATOR BETA/ AIL
4.1605581E-02 S3
-1.0326662E+00 S2
-4.3469572E+00 S1
3.0744481E-01 S0

NUMERATOR P/ AIL
4.2978226E+01 S3
1.6985367E+01 S2
3.9889917E+02 S1
-3.1175977E-01 S0

NUMERATOR R/ AIL
3.8401041E+00 S3
6.5671339E+00 S2
2.7063492E+01 S1
1.201059E+01 S0

NUMERATOR P/ RUD
1.0342430E+01 S3
-9.1126400E-01 S2
-1.4926992E+01 S1
3.0089311E-02 S0

NUMERATOR R/ RUD
-2.7230482E+00 S3
-6.9510231E+00 S2
-1.6272211E+00 S1
-4.4527000E-01 S0

NUMERATOR AY/ AIL
-6.4223801E+01 S4
-1.0285693E+02 S3
-2.4806982E+02 S2
-1.1754688E+02 S1
-3.8948227E+01 S0

NUMERATOR AY/ RUD
1.9083496E+01 S4
3.7085205E+01 S3
-3.4884424E+02 S2
-6.3518213E+02 S1
7.2460232E+00 S0

NUMERATOR /

AIRCRAFT STATE

MACH =	1.30000	ALT =	40000.00	VTRFPS =	1259.05
N2 =	.99801	ALPHA =	3.49960	BETA =	.000000
GAMMA =	.00000	THETA =	3.49962	ACGW =	15926.00
IXX =	4548.00	IYY =	49429.00	IZZ =	52531.00
IXZ =	1827.00	XCG =	450.56006	ZCG =	64.88000
GEAR DOWN:	F	NY =	.00000	NX =	.00000
NORMAL MODE:	T	DR MODE:	F	AR MODE:	F

CONTROLS

CANARDS=	-1.67758	FLAPS =	-.84759	STRAKES=	-8.86696
AILERON=	.00000	RUDDER =	.00000		
THRUST =	6250.461	% RPM =	84.30560		

DYNAMICS

CXAERO =	.00000000	CZAERO =	-.18452901		
CLMAERO=	.00000000	CMMAERO=	.00000000		
VC KTS =	423.966	DYN PR =	465.53027	RHO =	.000058734

A/C CONSTANTS

AREA =	185.0490	CBAR =	7.2200	SPAN =	27.2000
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04/23/92 10:20:30 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 2

LONGITUDINAL NONDIMENSIONAL DERIVATIVES

	CX BODY	CZ BODY	CM	THRUST(L3S)
ALPHA (PER RAD)	.1954049	-5.5153999	.3474554	.0000000
PITCH RATE(PER RAD)	.0000000	-5.6433468	-7.8051243	.0000000
STRAKE (PER RAD)	.0094373	-.1388975	-.2853293	.0000000
MACH (PER M #)	-.0281435	.1287043	-.2086425	4660.0000000
ALPHA DOT (PER RAD)	.0000000	-.3704265	-.13850050	.0000000
CANARD (PEP RAD)	-.0365331	-.5175204	.6851836	.0000000
FLAPERON (PER RAD)	.0200535	-.6250997	-.6357503	.0000000

LATERAL NONDIMENSIONAL DERIVATIVES

	CY BODY	CN	CL
BETA (PER RAD)	-1.2321653	.2525761	-.0917249
ROLL RATE (PER RAD)	.0000000	.0606781	-.4857363
YAW RATE (PER RAD)	.0000000	-.4446058	.22222201
AILERON (PER RAD)	-.2681391	.0969180	.0750780
RUDDER (PER RAD)	.0858089	-.0629783	.0191189

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 3

LONGITUDINAL SYSTEM

BODY-AXIS DIMENSIONAL STABILITY DERIVATIVES

		² FT/SEC**2	^M RAD/SEC**2	^X FT/SEC**2
ALPHA	(PER RAD)	-958.-4235840	4.-1610947	32.1928406
ALPHADOT	(PER R/S)	-.1841514	-.0497831	-.0000000
Q	(PER R/S)	-2.8159876	-.2815988	-.0000000
VEL	(PER FT/S)	.0187018	-.0028290	-.0138832
STRAKE	(PER RAD)	-24.1727448	-3.5903320	1.6424055
FLAPRN	(PER RAD)	-108.7878876	-7.9997215	3.4899712
CANARD	(PER RAD)	-90.0655518	8.6217461	-6.3579636

A Matrix:

VEL	ALPHA	Q	THETA	STRAKE	FLAPRN	CANARD
-1388E-01	.3219E+02	-7685E+02	-.3211E+02	.1642E+01	.3490E+01	-.6358E+01
-1488E-04	-.7625E+00	.9976E+00	-.1563E-02	-.1923E-01	-.8655E-01	-.7166E-01
-.2830E-02	*4.199E+01	-.3313E+00	.7779E-04	-.3589E+01	-.7995E+01	.8625E+01
.0000E+00	.0000E+00	.1000E+01	.0000E+00	.0000E+00	.0000E+00	.0000E+00

B Matrix:

SYSTEM POLES

-2.6458645E+00	,+J(0.0000000E+00)
1.5918798E+00	,+J(0.0000000E+00)
-2.6850533E-02	,+J(1.2356019E-01)
-2.6850533E-02	,+J(-1.2356019E-01)

DYNAMICS

PERIOD= 50.8512	WD= -12356
ZETA= .21235	WN= .12644

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MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 4

CHARACTERISTIC POLYNOMIAL

NUMERATOR	U/STRK	ALP/STRK	NUMERATOR	Q/STRK	NUMERATOR	THT/STRK
1.6424055E+00	S3	-1.9232184E-02	-3.5893745E+00	S3	0.0000000E+00	S3
2.7703589E+02	S2	-3.5874214E+00	-2.8722610E+00	S2	-3.5893745E+00	S2
2.0988072E+02	S1	-4.0530451E-02	-3.9088510E-02	S1	-2.8722610E+00	S1
9.0681473E+01	S0	3.5475290E-03	2.9642897E-06	S0	-3.9088510E-02	S0
NUMERATOR	U/FLAP	ALP/FLAP	NUMERATOR	Q/FLAP	NUMERATOR	THT/FLAP
3.4899712E+00	S3	-8.6553216E-02	-7.9954128E+00	S3	0.0000000E+00	S3
6.1551221E+02	S2	-8.061522E+00	-6.5811024E+00	S2	-7.9954128E+00	S2
4.8181912E+02	S1	-8.0498695E-02	-8.5283577E-02	S1	-6.5811024E+00	S1
2.0788867E+02	S0	1.18713890E-02	6.5767799E-06	S0	-8.5283577E-02	S0
NUMERATOR	U/CAN	ALP/CAN	NUMERATOR	Q/CAN	NUMERATOR	THT/CAN
-6.3579636E+00	S3	-7.16574779E-02	-8.6253138E+00	S3	0.0000000E+00	S3
-6.7215308E+02	S2	8.5799007E+00	6.4139481E+00	S2	8.6253138E+00	S2
-4.5807202E+02	S1	1.2929159E-01	1.0284895E-01	S1	6.4139481E+00	S1
-2.0202924E+02	S0	2.1762846E-03	-7.1956465E-06	S0	1.0284895E-01	S0
NUMERATOR	AN/STRK	AN/FLAP	NUMERATOR	AN/CAN	NUMERATOR	THT/CAN
-2.4169205E+01	S4	-1.0877197E+02	-9.0052399E+01	S4	0.0000000E+00	S4
2.4531250E+00	S3	-1.3496094E+01	-5.7070313E+01	S3	-7.8810273E+03	S2
3.5516045E+03	S2	8.1536445E+03	1.0917351E+02	S1	-1.1391934E+02	S1
4.7940033E+01	S1	-1.7575693E-01	2.1103203E-01	S0	2.1103203E-01	S0

LATERAL-DIR. SYSTEM

BODY-AXIS STABILITY DERIVATIVES

		Y	L	N
		FT/SEC**2	RAD/SEC**2	RAD/SEC**2
BETA	(PER RAD)	-214.4373322	-43.3369904	9.7589903
P	(PER R/S)	.0000000	-2.7295818	-.0656977
R	(PER R/S)	.0000000	1.1669350	-.1736327
AILERON	(PER RAD)	-46.6650391	40.9900208	5.7486687
RUDDER	(PER RAD)	14.9335680	8.8452816	-2.5015326

A Matrix:

BETA	P	R	PHI	AIL	RUD
-1.1703E+00	*6104E-01	-.9981E+00	.2551E-01	-.3706E-01	.1186E-01
-4.334E+02	-.2730E+01	.1167E+01	.0000E+00	*4099E+02	.8845E+01
-9759E+01	-.6570E-01	-.1736E+00	.0000E+00	.5749E+01	-.2502E+01
.0000E+00	.1000E+01	.6116E-01	.0000E+00	.0000E+00	.0000E+00

SYSTEM POLES

-2.7606922E-01	/+J(3.4604406E+00)
-2.7606922E-01	/+J(-3.4604406E+00)
-2.5261230E+00	/+J(0.0000000E+00)
6.7477148E-03	/+J(0.0000000E+00)

DYNAMICS

PERIOD= 1.8157 WD= 3.46044
 ZETA= .07953 WN= 3.47144

04/23/92 10:20:30 TASK # 08000006

MODELS ENCORE COMPUTER CORP. MPX-32 3.5 U01 MPX.D24 PAGE 6

****CHARACTERISTIC POLYNOMIAL****

1.0000000E+00 S⁴
3.0735302E+00 S³
1.3431209E+01 S²
3.0378204E+01 S¹
-1.4455217E-01 S⁰

NUMERATOR BETA/ AIL

P / AIL

5.0990021E+01 S³

2.2412994E+01 S²

6.5015210E+02 S¹

-1.0134439E+00 S⁰

NUMERATOR R/ AIL

5.7486687E+00 S³

1.3615895E+01 S²

4.0746017E+01 S¹

1.6557449E+01 S⁰

NUMERATOR PHI/ AIL

0.0000000E+00 S³

4.1341568E+01 S²

2.3245667E+01 S¹

6.5264404E+02 S⁰

NUMERATOR BETA/ RUD

P / RUD

8.8452816E+00 S³

-3.9082330E-01 S²

-2.2236465E+01 S¹

3.4351926E-02 S⁰

NUMERATOR R/ RUD

-2.5015326E+00 S³

-7.7195530E+00 S²

-2.2604637E+00 S¹

-5.6335425E-01 S⁰

NUMERATOR PHI/ RUD

0.0000000E+00 S³

8.6922989E+00 S²

-8.6291474E-01 S¹

-2.2374695E+01 S⁰

NUMERATOR AY/ AIL

AY / RUD

1.4905724E+01 S⁴

3.6143799E+01 S³

-4.7571362E+02 S²

-1.1629285E+03 S¹

7.9299774E+00 S⁰